BRITISH MEDICAL JOURNAL

LONDON SATURDAY OCTOBER 30 1937

THE STAPHYLOCOCCI PATHOGENIC FOR MAN*

BY

JOSEPH W. BIGGER, M.D., Sc.D., F.R.C.P.I.

Professor of Bacteriology and Preventive Medicine, Trinity College, Dublin

In my opinion the main function of a meeting of one of the specialized Sections, such as that of pathology and bacteriology, held in connexion with an Annual Meeting of the British Medical Association, is to act as a focus from which the laboratory worker may radiate knowledge of the recent developments in his special sphere, and particularly of those which are of practical importance to his professional colleagues, whether these be physicians, surgeons, or gynaecologists.

My communication to-day is therefore designed to place at the disposal of the medical profession what I regard as the outstanding discoveries of the past fifteen years concerning the pathogenic staphylococci. I have attempted not merely to predigest and to render both assimilable and palatable to those who are not specialists in the subject the enormous mass of literature which has grown up around the staphylococci, but also to assess the practical importance of some of the many discoveries made during this period.

For several years the staphylococci were my chief bacteriological hobby, but for the past four years, while still interested in these bacteria, I have taken no active part in investigations concerning them. In attempting to prepare this paper I first consulted that indispensable publication the *Quarterly Cumulative Index Medicus* in order to survey the field, and I confess that I was appalled to find that in a very few years it had so much outgrown my knowledge of it.

Almost the only good result of the great war was the impetus it gave to bacteriological research, but during the war staphylococci were not much studied. They never became a military problem as did the meningococcus, the gonococcus, the *Treponema pallidum*, the enteric and dysentery bacilli, and the anaerobic bacteria, presumably because staphylococcal infections were not noticeably more common among soldiers than among civilians. So the war left the staphylococci as it found them, and the immediately post-war textbook on bacteriology gave practically the same information about them as did its pre-war predecessor. But shortly after the end of the war staphylococci came into fashion, for there are fashions in subjects of research and papers as in other things. Just how popular these cocci have become among bacteriologists and those who apply bacteriology to clinical medicine may be appreciated by noting the number of entries relating to staphylococci in each of a series of years in the *Quarterly Cumulative Index Medicus*. The number of references given were, in 1921, 8; in 1926, 43; in 1931, 95; and in 1936, 267.

Before studying the development of our knowledge of the staphylococci since 1922, I must outline the field I hope to cover. I propose to limit the field to the organisms which in 1914 were usually called the *Staphylococcus pyogenes aureus* and *Staphylococcus pyogenes albus*, but which are, I believe, better grouped together as *Staphylococcus pyogenes*. I do not propose to make further mention of the *Staphylococcus pyogenes citreus*, in the existence of which as a pathogen I have little belief; of the *Staphylococcus epidermidis*, which may be either included in the species *Staphylococcus pyogenes* or disregarded as non-pathogenic; orof the *Micrococcus tetragenus*, frequently considered as a staphylococcus.

The Exotoxins

The pre-war and immediately post-war bacteriologists realized the ubiquity and importance of the *aureus* and *albus* types of *Staphylococcus pyogenes* as human pathogens, but devoted little time to studying them because they believed that everything of value was already known. So far as one can judge from the textbooks of the period the staphylococci were believed to owe their pathogenic power to their endotoxins. It was allowed that they produced such exotoxins as haemolysin, first demonstrated on blood-agar cultures by Kraus in 1900, and in filtrates of broth cultures by Neisser and Wechsberg in 1901, and leucocidin, which was discovered by van de Velde in 1894. That these were true exotoxins was demonstrated by the capacity of animals treated with them to fabricate antilysin and antileucocidin, but these toxins were not generally considered to play any important part in the pathogenicity of the organisms. The existence of such soluble products of their metabolism as gelatinase, which liquefied gelatin, and a proteolytic enzyme which dissolved coagulated serum was recognized, but their importance was merely as bases of classification.

The current views of that period on immunity to staphylococci were dominated by Wright and his school. It was held that if there was in the circulating blood and tissue fluids a plentiful supply of opsonin, the cocci were so transformed by it that phagocytosis actively occurred

* Read in opening a discussion in the Section of Pathology, Bacteriology, and Immunology at the Annual Meeting of the British Medical Association, Belfast, 1937.

and the invading organisms were defeated. Vaccine therapy, the undoubted success of which in staphylococcal lesions led to its less successful employment as a therapeutic measure in many other conditions, was based on, and apparently confirmed the belief in, opsonins.

In view of our present knowledge of the importance of the exotoxins of the staphylococci, it is curious how early demonstrations of the pathogenic action of these toxins as found in broth-culture filtrates by von Lingelsheim (1899) and Neisser and Wechsberg (1901) were either forgotten or neglected. The more complete work of Kraus and Pribram (1906), demonstrating the presence in broth-culture filtrates of a toxin which, injected intravenously, killed rabbits in less than thirty minutes, and which could be neutralized by an antitoxin, did not until long afterwards attract the attention it merited. Even the publication of similar results and the demonstration of the production of necrosis following subcutaneous injection of the toxin by Nicolle and Césari (1914) was overlooked for more than ten years, but possibly the time of publication was not propitious for the appreciation of the importance of such work.

Milestones on the Road to Knowledge

The great war did not directly stimulate research on staphylococci, but indirectly it had an important effect, as it led to the discovery of a number of new exotoxins such as those of *B. welchii, Vibrion septique,* and *B. oedematiens.* The realization that there were other exotoxins, in addition to those of *B. diphtheriae, B. tetani,* and *B. botulinus,* encouraged bacteriologists to engage in a reinvestigation of bacteria formerly believed to be endotoxigenic rather than exotoxigenic. Among such investigations were those of the Dicks into the mode of action of the streptococci of scarlet fever. These were facilitated by the employment of a comparatively new technique, that of intradermal inoculation, which had proved so useful in the study of diphtheria toxin by Schick. It is probable that Parker investigated staphylococci afresh largely as a result of the demonstration by the Dicks of the production by a coccus of an exotoxin. Whether or no this was her stimulus, despite the fact that the production of necrosis by filtrates of staphylococcal broth had been described ten years previously by Nicolle and Césari (1914) and despite the fact that she almost missed the rapid killing action of the toxin on rabbits, her first paper (Parker, 1924) must be regarded as by far the most important milestone on the road which leads from the old to the new knowledge of staphylococci. Her next paper (Parker, Hopkins, and Gunther, 1926) was possibly even more important, as it first described the application of the method of Cohen and Fleming (1918)—in which cultures are incubated in an atmosphere containing an excess (10 per cent.) of carbon dioxide—to broth cultures of staphylococci intended for the preparation of toxin.

I hope that it is not vanity which leads me to describe as the next milestone my own contribution published in a paper by Bigger, Boland, and O'Meara (1927). This was the discovery that much more active toxin could be prepared by growing staphylococci on the surface of agar than in broth. This was merely a rediscovery, and the credit should go to Oppenheimer (1911), who first described the method, rather than to us. We were chiefly interested in the product as haemolysin, although we recorded its toxicity, which led to the death of five out of the six rabbits we had attempted to immunize with it. For the moment Parker and we were apparently working on quite different lines.

The next milestone was not a laboratory discovery but a most unfortunate disaster. In 1928, in Bundaberg, a number of children were injected with a diphtheria prophylactic which did not contain any antiseptic. Staphylococci had been introduced into the bottle by some accident and had grown in the fluid. Twelve of the inoculated children died, some within such a short period as to suggest a toxaemia rather than an infection. Burnet was one of those who investigated the matter, and in his first paper (Burnet, 1929) he described the threefold action of filtrates of broth cultures of staphylococci grown, as suggested by Parker, in atmospheres containing 10 per cent. of carbon dioxide: the rapid killing effect of Kraus and Pribram following intravenous inoculation; the skin necrosis effect of Parker following intradermal inoculation; and the lytic effect on red blood cells. In subsequent work Burnet (1930) used excess carbon dioxide in the atmosphere and agar, so combining the methods of Parker, Oppenheimer, and Bigger, Boland, and O'Meara. He used soft (1 or 0.8 per cent.) agar, which after culture had taken place was minced and the fluid containing the toxin expressed and filtered. In this paper he discussed the function of the carbon dioxide, and concluded that it acted as a buffer. Bigger (1933) showed that by a combination of a fermentable carbohydrate and phosphate buffer in the medium the *p*H during culture could be kept at the correct level, and that with most staphylococci either method of controlling the reaction proved satisfactory for toxin production. Some modification of Burnet's method—soft agar and excess carbon dioxide—is now almost universally used for the preparation of toxin by staphylococci. It is only recently that the work of McClean (1937) has served to explain why agar is superior to broth. It appears from his results that agar, cellophane, filter paper, kieselguhr, and kaolin act as adsorbants, removing from broth some unidentified substance which is prejudicial to the formation of toxin.

Preparation and Effects of Staphylococcal Toxin

Following Burnet's work many papers were published dealing with the preparation and effects of staphylococcal toxin. When its lytic action was investigated it was found that in some cases it acted like other haemolysins at 37° C., while in other cases lysis occurred chiefly at air temperature after the lysin and cells had been kept for some time at 37°, the "hot–cold" phenomenon of Bigger, Boland, and O'Meara. Differences were also observed in the power of lysin to haemolyse the cells of different animal species. The confusion and controversy were resolved by Glenny and Stevens (1935), who showed that staphylococci might produce either one, or both, of two lysins which they called α and β. The α lysin acts on both sheep and rabbit cells at 37° C., the β only on sheep cells, and, on them, best at air temperature after contact at 37°. There is now fairly general agreement that the α lysin is identical with the skin-necrosing toxin and the rapid-killing toxin. The β lysin has some toxic action, causing a flush without necrosis or intradermal inoculation, and is probably responsible for the delayed death of inoculated animals. The two substances are now usually called the α and β toxins. Glenny and Stevens found, in the case of the staphylococci which they investigated, that the majority produced only α toxin, that a few produced both α and β toxins, and that none produced only β toxin. Minett (1936) reinvestigated this question using staphylococci from both human and animal sources, and found that almost all animal strains produced β toxin, usually associated with α, but in a few

cases with little or no α toxin. The toxin of bovine strains is predominantly β. Morgan and Graydon (1936) produced evidence which suggests that α toxin is complex, consisting of at least two distinct toxins, α 1 and α 2.

There is now general agreement that the α toxin is of greater importance in human disease than the β toxin, but until recently the identity or otherwise of one of these with leucocidin was in dispute. Weld and Gunther (1931) believed that leucocidin was distinct from necrosing toxin, as also did Panton and Valentine (1932). Burnet and Freeman (1932) thought that the two were identical, and the conclusion of Wright (1936) was that α toxin and leucocidin were the same. Valentine (1936) has cleared up the confusion by demonstrating that α toxin has a destructive action on rabbit leucocytes, which had been used by some of the earlier investigators, but practically none on human leucocytes, and also that many strains of staphylococci produce a true leucocidin, destructive for both human and rabbit leucocytes but without action on red cells. Proom (1937) reported the important finding that the conditions necessary for the production of maximum yields of α toxin and of leucocidin are different.

Burnet (1929) discovered that the toxin of staphylococci, like that of *B. diphtheriae*, could by treatment with formalin be converted into toxoid, which is non-toxic but acts antigenically in the same way as toxin, giving rise in inoculated animals to the production of antitoxin. This, later, was found to be true of both the α and β toxins, although Dolman and Kitching (1935) point out that β toxin is more resistant to formalin than is α. It is probable that leucocidin can also be toxoided.

As a result of the labours of many workers we now have available the knowledge that staphylococci produce at least three toxins—α, β, and leucocidin—of which the first and last are of importance in relation to human disease, while the role of the β toxin is less certain; that we can titrate the amount of antitoxins to these in the blood sera of men and animals, whether normal, infected, or immunized; that it is possible actively to immunize men and animals against these toxins; and that for the treatment of human disease the antitoxic sera of immunized animals may be employed. Some of the practical applications of these discoveries will be considered later.

Attempts to Devise a Skin Test

A number of attempts have been made to devise a skin test, comparable to the Schick test, by which the immunity of the human subject to staphylococci or their products might be determined. Among papers dealing with this subject those of Pilot and Afremow (1927), Hardenbergh and Schlotthauer (1927), Afremow and Pilot (1929), Panton, Valentine, and Dix (1931), and Bryce and Burnet (1932) deserve mention. Most investigators have found that a large proportion of human beings give positive skin reactions following intradermal injection of staphylococcal toxin, but it appears to be established that a positive response cannot be correlated with recent infections or freedom from these or with the amount of antitoxin in the serum. It is possible that the confusion is due to the fact that positive results may be obtained in persons whose antitoxin level is low in respect of either the known or some as yet unknown toxins, and also in those who as a result of past infections have become hypersensitive or allergic to the cocci and particularly, as the work of Julianelle and Wieghard (1935) suggests, to their protein constituents. The first type of response would correspond to a positive Schick test, the second to a positive tuberculin test. That hypersensitivity may play an important part in the aetiology of staphylococcal lesions is suggested by the finding of Panton, Valentine, and Dix (1931) that an animal repeatedly injected intradermally with staphylococci develops immunity, as is shown by a decrease in the size of the skin lesion caused by a measured dose of cocci, and also an increased sensitivity, as is shown by the development of lesions after the introduction of one-hundredth of the minimum dose of cocci capable of causing infection in a normal animal.

Coagulase

One further soluble product of staphylococci remains to be mentioned. This is coagulase, which causes the clotting of plasma and which is quite distinct from the toxins already considered. Loeb (1903) first described the phenomenon, which was more fully investigated by Much (1908), von Gonzenbach and Uemura (1916), and others. The majority of pathogenic staphylococci coagulate rabbit plasma, but many specimens of human plasma are resistant to coagulase. This difference is probably to be explained by the presence of anticoagulase in many human bloods, the result of frequent infections of man by staphylococci, whereas rabbits under natural conditions are but rarely infected. At first sight coagulation of plasma would appear to be a useful defence mechanism for an animal infected with staphylococci, as it would tend to limit the spread of the organisms, and therefore that anticoagulase would conduce to a spread of infection. This apparent failure of an immune substance to achieve its defensive purposes is explained by Gengou (1933), who suggested that coagulation of plasma is only the first effect of the so-called coagulase. Its main function, according to him, is fibrinolytic, for which action preliminary fibrin formation or coagulation is of course necessary. Anticoagulase, which in the test may prevent coagulation of plasma, in a staphylococcal lesion probably only slightly delays it, and later serves the useful purpose of holding up liquefaction until a defence barrier of polymorphonuclear leucocytes has collected around the site of invasion. This view fits in well with clinical observation. In the early stages of a boil the tissues appear to be hard and solid, and then, after a few days, softening and liquefaction occur.

The Opsonins

In reviewing the literature of the past fifteen years dealing with staphylococci the most surprising thing to me was the complete absence of any mention of opsonins, a reference to which, in pre-war literature on the subject, was a necessity. The newer view appears to be, "Look after the toxins and the bacteria will be looked after." The most enlightening paper I have read on this aspect of the subject is that of Downie (1937). This worker compared the effects of the introduction of living staphylococci into animals immunized against either staphylococcal toxins or staphylococci killed and repeatedly washed to free them from toxin. In both cases, as also in the case of normal animals, the living cocci became surrounded by a zone rich in polymorphonuclear leucocytes, but whereas in the normal or vaccine-treated animals the leucocytes were inactive in phagocytosis, in those immunized against toxin the leucocytes were actively phagocytic. Furthermore, necrosis of cells occurred in the case of the normal and vaccine-treated animals but not in those treated with toxoid. Injections of toxin in unprotected animals led to necrosis, but not to the accumulation of leucocytes. From this work it would appear that when the body, whether immune or non-

immune, is invaded by staphylococci phagocytes accumulate. In the non-immune animal these are to a large extent rendered ineffective by leucocidin, but in the animal immune to leucocidin and other toxins phagocytosis proceeds actively. The cocci appear to exercise a positive chemotaxis; but where are the opsonins which we were taught were essential for ingestion? All modern work disregards them to such an extent as to suggest that the current, although unexpressed, view is that if staphylococci and polymorphs come in contact the latter will ingest the former if they are not rendered incapable of doing so by the leucocidin secreted by the cocci. The positive action of opsonin has been replaced by the negative—that is, neutralizing—action of antitoxin, and a high opsonic index means no more than a high level of serum antitoxin. While accepting as well established the importance of antitoxic immunity, I am loath to jettison completely the old opsonin. After all, it is the cocci, either alone or in conjunction with opsonin, and not the toxin, which lead to the mobilization of polymorphs; and why should the positive chemotaxis which has attracted the cells to the vicinity of the site of invasion stop short of contact and then of ingestion? The neutrophil leucocytosis which is such a constant result of the invasion of the body by staphylococci demonstrates the effect of the cocci. In my view it would, for the present at least, be unwise to concentrate all our attention on antitoxins and to neglect anti-bacterial immunity. It may be that the success of vaccines in the treatment of chronic or recurrent staphylococcal lesions —a success which cannot be denied and to which was mainly due the vogue of vaccine therapy in general —was due to the close association of toxin with the cocci, and to the production of toxin by the growth of the cocci on solid media. The vaccine which we administered contained either toxin or toxoid or both, and the successful result of our treatment was due to these rather than to the actual cocci. Now, I suggest, we should attempt to increase antitoxin in the circulation either by active immunization with toxoids or by passive immunization with antitoxic serum—both of which methods have demonstrated their value in human infections—and anti-bacterial bodies by active immunization with vaccines completely freed from toxin.

Let us now attempt to derive some lessons of practical value from the mass of literature published during the past fifteen years.

Lessons from the More Recent Literature

The *Staphylococcus pyogenes* is a Gram-positive coccus, typically occurring in clusters, and is a common human parasite. The great majority of these staphylococci form, as judged by serological methods, a fairly homogeneous group consisting of three types. In culture they may display a greater or less power of pigment production, the colonies varying in colour from golden brown to white, the more highly pathogenic strains being usually well pigmented. The power of liquefying gelatin and of fermenting carbohydrates is inconstant, but pathogenic strains usually liquefy gelatin and ferment mannitol. The pathogenic power of the organisms is due chiefly, if not entirely, to the exotoxins they produce, which include some, or all, of α toxin, β toxin and leucocidin, and possibly other similar substances. They also produce coagulase, which causes the clotting of plasma followed by liquefaction. In the tissues they exercise a positive chemotaxis, attracting polymorphonuclear leucocytes to the affected part. For their elimination the body relies chiefly on the action of these cells, but for the prevention or limitation of damage chiefly on antitoxins. The staphylococci are among the commonest saprophytes and pathogens associated with man. They are frequently found on the surface or in the glands and follicles of the skin, living either saprophytically or displaying pathogenicity expressed in a long range of action between insignificant pustules and massive carbuncles, and including boils, acne, sycosis, and other skin diseases. Another important site from which they spread to other parts of the body of the same person, or to other persons, is the nose and nasopharynx. Here they may cause furunculosis, may be responsible for sinusitis, or may be present in the carrier state. From their primary site of invasion they may spread by the blood stream, in bacteriaemia, septicaemia, or pyaemia, to other situations, particularly bones and joints, the kidneys, and the heart, in some of which, but more particularly in bones, they may be responsible for lesions of great chronicity. The general effects of these toxins are not yet well understood, but may include damage to the heart and pancreas. As regards the latter, there is a definite connexion between staphylococci and sugar metabolism, as is shown by the occurrence of glycosuria in association with boils and carbuncles, and of boils and carbuncles in association with diabetes. The claim that certain cases of diabetes are benefited by active immunization with staphylococcal toxoid is at least worthy of serious investigation.

In connexion with infection by staphylococci the almost universal presence of these organisms on the skin and their frequent presence in the nares must be borne in mind. To infect, however, more than their presence is required, and such factors as sugar metabolism and local trauma, including pressure or friction such as that inflicted by a collar, should be investigated and the necessary corrections applied. Where lesions occur, fresh infections are best controlled by the use of suitable disinfectants; wet dressings are best avoided owing to their fostering action on the growth of the cocci.

Treatment of Staphylococcal Infections

In the treatment of infections the keynote should be rest and lack of interference. The importance of avoiding any surgical intervention in staphylococcal lesions about the face, owing to the risk of spread of cocci by blood stream or lymph, is now well known, but the same inactivity should be pursued in the case of boils and carbuncles wherever situated. Early incision is fraught with great danger, and Nature should be allowed to wall off the affected area by the coagulation of plasma and by the accumulation of polymorphs. Only when liquefaction has occurred should the surgeon be permitted to make a way of exit for the pus, and his incision should never transgress the protective zone. When the general symptoms are marked or the local lesion extensive, as in a carbuncle, antitoxic serum should be administered. Its utility in its present form is undoubted, and even better results may be expected when sera still richer in antitoxins to the three main toxins, α, β, and leucocidin, and to any others which may be discovered, are available. The treatment of more deep-seated infections demands similar measures, with special emphasis on the use of antitoxin.

For chronic and recurring infections it is of importance to attempt to find a focus, often unnoticed, from which the cocci spread to other parts. This is most frequently present in connexion with the upper part of the respiratory tract, particularly the nose. Its treatment will often bring

to an end a long-continued series of boils. The advisability of investigation of sugar metabolism has already been mentioned. Next comes active immunization, for which toxoid containing the three elements should be employed. At first the results of this treatment were controlled by estimations of the antitoxic titre of the serum, but it is doubtful if this is any more necessary than were estimations of the opsonic index in vaccine treatment. It is now known that much higher values of antitoxin may be found in the serum of a person who has suffered from and continues to suffer from almost innumerable boils than in that of a person free from them. The protective value of serum antitoxin against skin infections by staphylococci cannot be compared to the corresponding value of antitoxin as a protective against diphtheria. But it may be taken as well established that, even if the antitoxin content of the serum be high, it may be further increased, even as much as five- to tenfold, by active immunization, and that this may, and frequently will, suffice to bring the infections to an end. The most probable explanation is that susceptibility depends partly on antitoxin and partly on other factors, among which may be general metabolic peculiarities and peculiarities of the skin and its secretions. The person who is susceptible to staphylococcal infections for the latter reasons requires for his protection a much higher level of serum antitoxin than does he who is naturally insusceptible. As I indicated earlier, I do not as yet feel inclined to abandon vaccines, which may, I think, help to establish an antibacterial immunity just as toxoid does an antitoxic immunity. I would therefore suggest the combination of toxoid and of autogenous vaccine in which the cocci have been washed free of toxin and toxoid. It is as yet too early to be dogmatic about the number of injections or the total amount of toxoid to be used, but eight gradually increasing injections may, as Dolman (1935) suggests, be taken as a normal series, although obstinate cases may require twenty or more.

The work of the past fifteen years has taught us much about the *Staphylococcus pyogenes*, but it would be foolish to think that our knowledge is yet complete. It has, however, gone far enough to show us how ignorant we formerly were, and has most certainly improved the prognosis in the case of patients suffering from infections by this common organism.

Bacterial Food Poisoning

No paper dealing with the pathogenic staphylococci would be complete without some reference to the role of these organisms in the causation of bacterial food poisoning. The credit for the discovery goes, rightly, to Jordan, who alone and with collaborators (Jordan, 1930 and 1931; Jordan and Burrows, 1934) published a number of papers on the subject. Many strains of staphylococci, isolated from both human and animal sources, have been shown to elaborate, in broth cultures grown under suitable conditions, a filterable, fairly thermostable toxin which, when given by mouth to human volunteers or rhesus monkeys, causes within a few hours nausea, cramps, violent vomiting, diarrhoea, and prostration. The incriminated food has usually been confectionery of some sort, such as cake, commonly with cream or custard filling. The source of the organisms, which have multiplied in the food and there formed their toxin, appears to have been either the human skin or cow's milk. It has not yet been decided whether only special strains of staphylococci produce this enterotoxin or whether the majority of staphylococci have the power, but in either case strains yielding this toxin have shown diversity as regards chromogenesis and other cultural properties. The nature of the toxin is uncertain, but it is different from both the α and β toxins. It is doubtful whether it is antigenic.

Most records of staphylococcal food poisoning have come from America, but there can be little doubt that such attacks, which while unpleasant are never fatal, occur also in the British Isles.

As I have already said, twenty years ago most bacteriologists believed that everything of importance in connexion with staphylococci was known, and yet the intervening years have been fruitful in fresh discoveries. It is probable that similar intensive research in the case of other bacteria would yield equally unexpected and important discoveries.

REFERENCES

Afremow, M. L., and Pilot, I. (1929). *J. infect. Dis.*, **45**, 167.
Bigger, J. W. (1933). *J. Path. Bact.*, **36**, 87.
—— Boland, C. R., and O'Meara, R. A. Q. (1927). Ibid., **30**, 271.
Bryce, L. M., and Burnet, F. M. (1932). Ibid., **35**, 183.
Burnet, F. M. (1929). Ibid., **32**, 717.
—— (1930). Ibid., **33**, 1.
—— and Freeman, M. (1932). Ibid., **35**, 477.
Cohen, M. B., and Fleming, J. S. (1918). *J. infect. Dis.*, **23**, 337.
Dolman, C. E. (1935). *Lancet*, **1**, 306.
—— and Kitching, J. S. (1935). *J. Path. Bact.*, **41**, 137.
Downie, A. W. (1937). Ibid., **44**, 573.
Gengou, O. (1933). *Ann. Inst. Pasteur*, **51**, 14.
Glenny, A. T., and Stevens, M. F. (1935). *J. Path. Bact.*, **40**, 201.
Gonzenbach, W. von, and Uemura, H. (1916). *Zbl. Bakt.* (Orig.), **78**, 97.
Hardenbergh, J. G., and Schlotthauer, C. F. (1927). *J. infect. Dis.*, **40**, 667.
Jordan, E. O. (1930). *J. Amer. med. Ass.*, **94**, 1648.
—— (1931). Ibid., **97**, 1704.
—— and Burrows, W. (1934). *Amer. J. Hyg.*, **20**, 604.
Julianelle, L. A., and Wieghard, C. W. (1935). *J. exp. Med.*, **62**, 31.
Kraus, R., and Pribram, E. (1906). *Wien. klin. Wschr.*, **19**, 493.
Lingelsheim, W. von (1899). *Beitr. exp. Ther.*, **1**, 49.
Loeb, L. (1903). *J. med. Res.*, **10**, 407.
McClean, D. (1937). *J. Path. Bact.*, **44**, 47.
Minett, F. C. (1936). Ibid., **42**, 247.
Morgan, F. G., and Graydon, J. J. (1936). Ibid., **43**, 385.
Much, H. (1908). *Biochem. Z.*, **14**, 143.
Neisser, M., and Wechsberg, F. (1901). *Z. Hyg.*, **36**, 299.
Nicolle, M., and Césari, E. (1914). *Ann. Inst. Pasteur*, **28**, 219.
Oppenheimer, H. (1911). *Zbl. Bakt.*, **59** (Orig.), 188.
Panton, P. N., and Valentine, F. C. O. (1932). *Lancet*, **1**, 506.
—— —— and Dix, V. W. (1931). Ibid., **2**, 1180.
Parker, J. T. (1924). *J. exp. Med.*, **40**, 761.
—— Hopkins, J. G., and Gunther, A. (1926). *Proc. Soc. exp. Biol., N.Y.*, **23**, 344.
Pilot, I., and Afremow, M. L. (1927). *J. Amer. med. Ass.*, **89**, 939.
Proom, H. (1937). *J. Path. Bact.*, **44**, 425.
Valentine, F. C. O. (1936). *Lancet*, **1**, 526.
Weld, J. T. P., and Gunther, A. (1931). *J. exp. Med.*, **54**, 315.
Wright, J. (1936). *Lancet*, **1**, 1002.

The new nurses' home at Hackney Hospital, Homerton, was opened on Friday, October 15, by the Right Hon. Herbert Morrison, M.P., Leader of the London County Council. It was in December, 1934, that the Council decided to erect, at an estimated cost of £97,500, a new home for the nurses at Hackney Hospital. At that time the accommodation, besides being insufficient, was scattered and very unsatisfactory. The new building, which has accommodation for 265 sisters and nurses, is six storeys high, fronting Sidney Road. A training centre for nurses, which includes a lecture room, demonstration room, and a library, is also provided. A flat roof over the greater part of the building affords facilities for sun-bathing, physical exercises, and other recreational purposes.

TREATMENT OF THROMBOCYTOPENIC PURPURA*

BY

JANET M. VAUGHAN, D.M., M.R.C.P.

Senior Assistant in Clinical Pathology, British Postgraduate Medical School

Idiopathic thrombocytopenic purpura may be defined as a disease characterized by a prolonged bleeding time and diminished platelet count associated with haemorrhages from mucous membranes and into the skin, the aetiology of which is not known. Before making a diagnosis of idiopathic thrombocytopenic purpura it is essential to determine that no focus of infection and no sensitivity to any drug or food substances are present. The disease may occur in an acute and chronic form, and is liable to spontaneous and sometimes complete remissions. The effects of treatment are therefore difficult to assess. Few observers are explicit as to whether the cases reviewed are acute or chronic.

Many forms of treatment have been advocated. Their number alone suggests that none are specific.

Ascorbic Acid

Vitamin C has recently been used in the treatment of idiopathic thrombocytopenic purpura (Table I). No well-controlled observations on patients who have recovered are available. The patient of Böger and Schröder (1934) was a man, aged 60, who had had no previous haemorrhage,

TABLE I.—*Treatment with Ascorbic Acid*

Authority	No. of Cases	Follow-up	Cured	Failure
Vogt, 1935	2 A	?	2	
Böger and Schröder, 1934 ..	1 A	?	1	
Miller and Rhoads, 1936 ..	4 ?	?	4	
Szent-Györgyi, 1936	7	?		7
Wright and Lilienfield, 1936 ..	3	3-7 weeks		3
Davidson, 1937	3 C	7-10 days		3
Vaughan, 1937	1 C	6 weeks		1
Total	21		7	14

A=acute. C=chronic.

and no control period was observed. Vogt (1935) describes two successful cases. The diagnosis in one was doubtful as genital abnormalities were found; in the other a blood transfusion as well as vitamin C was given; in neither was the rise in platelets marked. Miller and Rhoads (1936) have published a preliminary report in which they claim that in four cases treated with ascorbic acid there was complete relief of symptoms and a rise in platelets. No details are available apart from the fact that in two instances improvement was associated with increased output of vitamin C in the urine. Wright and Lilienfield (1936) and Davidson (1936–7), on the other hand, each record three cases which failed to respond to parenteral treatment with ascorbic acid. Szent-Györgyi and his colleagues (Armentano *et al.*, 1936) and Patek (1936) also state that they have found ascorbic acid valueless. We have had a similar experience in one typical case. Szent-Györgyi (Armentano *et al.*, 1936) has recently isolated from lemon juice and from paprica a substance which he has called vitamin P or citrin; this is not present in orange juice. He has found citrin of value in preventing haemorrhage in vascular purpura—that is, purpura occurring in patients with a normal platelet count though with decreased capillary resistance—but useless in thrombocytopenic purpura. Thanks to the kindness of Dr. Smith and Dr. Macfarlane, who prepared some citrin according to the method of Szent-Györgyi, we were able to test this substance on one patient with thrombocytopenic purpura. Neither the platelet count nor the capillary resistance was improved—in fact, the patient became so ill that transfusion was necessary (see Chart).

CASE RECORD

A married man, aged 34, a tailor, had had crops of bruises for two years and bleeding haemorrhoids for two months. He was admitted to hospital with profuse haemorrhage from the gums following teeth extraction. On examination no physical signs apart from petechial haemorrhages and bleeding gums were found. Blood pressure was 110/60; red cells, 4,100,000 per c.mm.; haemoglobin, 74 per cent.; colour index, 0.9; white cells, 13,000 per c.mm.; platelets, 10,500 per c.mm. The bleeding time (Dukes's method) was five minutes. The Wassermann reaction was negative, the capillary resistance test positive. He developed a septic throat; the gums and remaining teeth were also septic.

Treatment.—On September 10, 1936, 80 mg. of ascorbic acid were injected intravenously; this was continued daily for five days with no significant improvement in the platelet count. Doses of 80 mg. of ascorbic acid were given by mouth daily from September 29 till November 2, when the dose was increased to 160 mg. daily until December 13. From December 22, 1936, till January 26, 1937, *x*-ray treatment to the spleen, totalling 4,500 *r* in fifteen periods, was given without significant improvement. On March 9 40 mg. of citrin were injected intravenously, and the same amount on April 6. Throughout this period, in spite of injections for haemorrhoids, the patient had repeated bleeding per rectum. Sigmoidoscopy showed this to be due to oozing from the whole rectal mucosa. On April 13 the red cells numbered 3,700,000 per c.mm., and the haemoglobin was 46 per cent. He refused splenectomy, and was given a transfusion. The platelet count has never reached a figure higher than 160,000 per c.mm., and has shown considerable fluctuations (see Chart). He had always had a positive tourniquet test, and crops of petechial haemorrhages or larger subcutaneous bruises have occurred spontaneously.

The value of ascorbic acid in thrombocytopenic purpura is certainly open to doubt at present, while that of vitamin P is not proven. Certain German workers (Schiff and Hirschberger, 1937) claim to have isolated a further vitamin, present in sesame oil, which they have called T. This is said to exert a specific effect upon the platelets. Further work is required to confirm their observations.

Internal Secretions and Liver

Repeated, though unsatisfactory, attempts have been made to involve certain internal secretions in the control of the blood platelets. Zondek (1936) treated a case of chronic purpura with thyrotropic hormone, and considered that a rise in platelets from 60,000 to 150,000 per c.mm. was a significant cure. Others have used ovarian extracts. Marzullo (1933) claims success in five patients, but gives no details of control periods or of the actual platelet counts. Since the platelet count rises in Addisonian pernicious anaemia after liver therapy (Nittis, 1930–1) it was suggested that such treatment might benefit thrombocytopenic purpura (Table II). Satisfactory results have been claimed (Mondon, 1928; Holboll, 1929; Jacob and Clapperton, 1930), but the majority of the cases were acute and no satisfactory control period was allowed. Witts (1931) had no success in five chronic cases.

* Read at a joint meeting of the Sections of Pathology and Medicine at the Annual Meeting of the British Medical Association, Belfast, 1937.

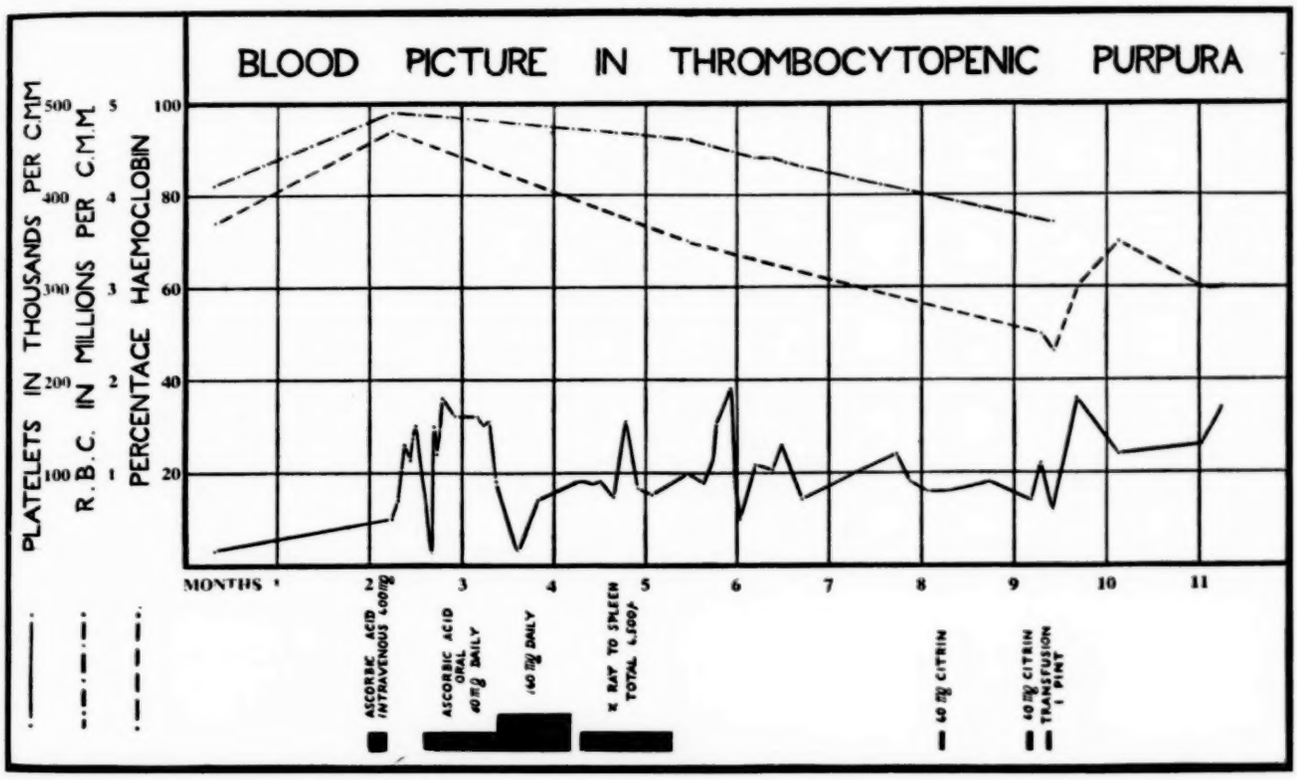
TABLE II.—*Treatment with Liver or Extract*

Authority	No. of Cases	Follow-up	Cure	Failure
Mondon, 1928	1 A	1 month	1	
Holboll, 1929	1 A	3 months	1	-
Jacob and Clapperton, 1930 ..	1 C	1 year	1	
Witts, 1931	5 C	2-4 months		5
Total	8		3	5

TABLE III.—*Treatment with Snake Venom*

Authority	No. of Cases	Follow-up	Cure	Failure
Peck and Rosenthal, 1936 ..	32 C	1 month to 4 years	17	15
Lowenburg and Ginsburg, 1936	1 C			1
Jones and Tocantins, 1936 ..	6 C		1	5
Davidson, 1937	3 C			3
Total	42		18	24

The parathyroid gland, because of its effect on the blood calcium, has also been involved. Lowenburg and Ginsburg (1932, 1936) have reported two patients with thrombocytopenic purpura who had failed to respond to treatment with venom and transfusions. Following the production of hypercalcaemia with parathyroid injections all bleeding stopped. In one instance the patient was perfectly well six weeks later, but in neither case did the platelet count return to a figure higher than 290,000 per c.mm. at any time. Mathewson and Cameron (1937) attempted to produce hypercalcaemia with injections of parathormone in one case without any success; neither the platelets nor the blood calcium rose.


BLOOD PICTURE IN THROMBOCYTOPENIC PURPURA
PLATELETS IN THOUSANDS PER C.MM
R.B.C. IN MILLIONS PER C.M.M.
PERCENTAGE HAEMOGLOBIN
MONTHS
ASCORBIC ACID INTRAVENOUS 1 GM/DAY
ASCORBIC ACID ORAL 40 MG DAILY
40 MG DAILY
X RAY TO SPLEEN TOTAL 1,500 r
40 MG CITRIN
40 MG CITRIN TRANSFUSION 1 PINT

Snake Venom

Peck and Rosenthal (1936) claim that repeated injections of moccasin snake venom are extremely successful (Table III). Venom is given subcutaneously. In patients over 10 years old the initial injection is 0.4 c.cm., which is rapidly increased in subsequent injections to 0.8 or 1 c.cm. as a maximum dose. This is usually given twice a week. If symptoms are severe it is given every third day at least. Symptomatic improvement was obtained in seventeen chronic cases, but the platelet count was unchanged. Four cases failed to improve, and in eleven it was necessary to perform splenectomy or ligate the splenic artery. Other workers have failed to obtain any satisfactory result with venom (Davidson, 1936–7; Lowenburg and Ginsburg, 1936; Jones and Tocantins, 1936).

Blood Transfusion

Repeated small transfusions have been thought to accelerate recovery (McLean *et al.*, 1932; Jones and Tocantins, 1933, 1936): 300 c.cm. is regarded as the maximum dose in adults, and is reduced considerably for children. This should be given not less often than every five days, and may be administered daily. Jones and Tocantins (1936) have recently summarized their experience of treating twenty-two patients with transfusions: eight showed permanent improvement, seven temporary improvement, and seven no improvement, and they conclude, therefore, contrary to their former belief, that transfusions are not always effective. These are probably of greatest value in patients who refuse splenectomy or before operation in patients with severe haemorrhage.

X-Ray Treatment

The application of *x* rays to the spleen has been advocated by many observers (Table IV) (Stephan, 1920; Bucky and Guggenheimer, 1922; Gragert, 1921; Hippe and Kochmann, 1932). Many of the early case reports

TABLE IV.—*Treatment with X Rays*

Authority	No. of Cases	Follow-up	Cure	Failure
Stephan, 1920	2 A		2	
Bucky and Guggenheimer, 1922	1		1	
Gragert, 1921	1 A	10 days	1	
Cori, 1922	1	2 months		1
Pancoast, 1925..	5 C, 1 A	3 days-3 years		6
Hippe and Kochmann, 1932 ..	7 A	8-40 days	7	
Marzullo, 1933	2 C			2
Mettier, 1936	6 C, 1 A	1-7 months	6	1
Rudisill, 1936	7	4 months-4 yrs.	7	
Jones and Tocantins, 1936 ..	6 C			6
Davidson, 1937	3 C	7-14 days		3
Mettier, 1937	1 C	3 months	1	
Vaughan, 1937..	1 C	3 months		1
Total	45		25	20

TABLE V.—*Treatment by Splenectomy*

Authority	No. of cases	Cure	Improved	Operative Mortality	Follow-up	Failure
*Eliason and Ferguson, 1932	213	156	17	13.1%	6 mths. to 5 yrs.	6
Pemberton, 1934	57	36	20	7%	2 mths. to 9 yrs.	1
Williamson, 1934	2				9 years	2
Hartfall, 1934 ..	1	1			6 mths.	
Brown and Elliott, 1936 ..	10	8	1		1 mth. to 11 yrs	1
Geggie, 1936 ..	6	5			1 month	1
Myers, 1935 ..	1	1			9 years	
Jones and Tocantins, 1936	9	6	3			
Pollok, 1936 ..	1	1			4½ yrs.	
Smith, 1936 ..	1	1			15 mths.	
Davidson, 1937	2	2				
Total ..	303	217	41			11

* These figures include those of previous summaries, notably those of Spence (1928) and Quénu (1929).

show that acute cases were treated, that no control period was given, and that the follow-up was short. Pancoast (1925), who had a follow-up of three years in some instances, reported complete failure in five chronic cases and in one acute case. Interest in this form of therapy has recently been revived by the report of Mettier and his colleagues (Mettier, Stone, and Purviance, 1936; Mettier, 1937). They record success in seven chronic cases. An increase in platelets occurred within twenty-four to forty-eight hours, rising as high as 250,000 to 500,000 within nine days. In some instances relapse occurred one to seven months after the cessation of treatment. Rudisill (1936) concludes from a study of seven patients that Roentgen radiation constitutes an exceedingly valuable and possibly a specific therapeutic agent when applied over the spleen in primary or complicated thrombopenia with haemorrhage. His case records are, however, scanty. We have found, in agreement with Jones and Tocantins (1936), Marzullo (1933), and Davidson (1936–7), that *x*-ray therapy is without effect (see Chart).

Splenectomy

The majority of observers agree that at present splenectomy (Table V) gives more satisfactory results than any other line of treatment in thrombocytopenic purpura. The operation was first performed in 1916 at the suggestion of Kaznelson. Since that time all reviews have shown increasingly satisfactory results, presumably as pre-operative, surgical, and anaesthetic technique improved. Whipple in 1926, reviewing eighty-one cases, found an operation mortality of 16 per cent., a risk which was constant in 1929 when Quénu surveyed 122 cases. Eliason in 1932 observed that the operation mortality had dropped to 13 per cent., while Giffin (1932), reviewing the experience of the Mayo Clinic, found the rate to be as low as 7 per cent., a figure which was present two years later when thirteen additional cases were discussed (Pemberton, 1934). Brown and Elliott (1936) performed ten splenectomies without post-operative disaster. The series of Brown and Elliott (1936) is of considerable interest since eleven untreated cases were used as a control group. Three of the latter recovered completely, but five were unimproved and two were only slightly better. Splenectomy, though it would undoubtedly appear to result in clinical improvement, does not necessarily affect the platelet count except transitorily (Evans, 1928; Spence, 1928; and Brown and Elliott, 1936). There is usually a definite pre-operative rise, though not necessarily to normal figures, followed by a fall, the count being then maintained at a low level. Until recently it has been thought that the operation risk in acute cases was too great to justify splenectomy in fulminating purpura. Whipple (1926) records seven deaths in eight acute cases at operation, Spence (1928) ten deaths in twelve cases. Eliason (1932), however, in twenty-two patients splenectomized during a fulminating attack between 1928 and 1932, found the mortality had dropped to 13.6 per cent., a figure accepted as representative of modern results by Brown and Elliott (1936). Few cases are reported in which the results are satisfactory for the first few months after splenectomy but which subsequently relapse (Williamson, 1934). It appears probable that such relapses are due to the development of a splenunculus, and are by no means an inevitable result of splenectomy. Maingot (1936), who made a careful search for accessory spleens in a series of thirteen cases of splenectomy for purpura haemorrhagica, found them in seven. There are several patients who have remained well for as long as eleven years after operation.

TABLE VI.—*Summary of Treatment Results*

Treatment	No. of Cases	Cured	Improved	Failure
Ascorbic acid	21	7		14
X rays	45	25		20
Snake venom	42	18		24
Liver extract	8	3		5
Hypercalcaemia	2	2		0
Splenectomy	303	217	41	11

The figures reviewed are not necessarily complete, but they are presumably representative. They show cure in 217 cases, improvement in forty-one, and failure in only eleven, apart from those that did not survive operation.

Conclusions

It would appear, therefore, that the chance of curing a patient with thrombocytopenic purpura by the administration of ascorbic acid is, from the evidence at present available, 33 1/3 per cent. There is a rather higher chance that *x* rays may be of value—twenty-five favourable reports against twenty unfavourable have been found. Observations on snake-venom therapy at present show eighteen patients benefited and twenty-four with no improvement. There is no evidence that liver extract is of value. Hypercalcaemia has been tried in too few cases to permit of any conclusion. Transfusion has its greatest value in tiding an acute case over the preliminary stage and in pre-operative preparation. Splenectomy to-day has an immediate mortality rate of 7 per cent. or rather less, and the majority of patients who recover from operation have a reasonable chance of permanent improvement.

I am grateful to Professor F. R. Fraser for permission to make use of his clinical notes, and to Dr. G. Smith and Dr. R. G. Macfarlane for supplies of vitamin P "citrin."

References

Armentano, Von L., Bentsáth, A., St. Rsuznyák, and Szent-Györgyi, A. (1936). *Dtsch. med. Wschr.*, **62**, 1325.
Böger, A., and Schröder, H. (1934). *Münch. med. Wschr.*, **81**, 1335.
Brown, D. N., and Elliott, R. H. E. (1936). *J. Amer. med. Ass.*, **107**, 1781.
Bucky, G., and Guggenheimer, H. (1922) *Klin. Wschr.*, **1**, 11.
Cori, G. (1922). *Z. klin. Med.*, **94**, 356.
Davidson, L. S. P. (1936–7). *Proc. roy. Soc. Med.*, **30**, 715.
Eliason, E. L., and Ferguson, L. K. (1932). *Ann. Surg.*, **96**, 801.
Geggie, C. G. (1936). *Canad. med. Ass. J.*, **35**, 651.
Giffin, H. Z. (1932). *Trans. Ass. Amer. Phys.*, **47**, 218.
Gragert, O. (1921). *Zbl. Gynäk.*, **45**, 1569.
Hartfall, S. J., and Oldfield, C. (1934). *British Medical Journal*, **2**, 8.
Hippe, H., and Kochmann, R. (1932). *Jhrb. Kinderheilk.*, **136**, 302.
Holboll, S. A. (1929). *Hospitalstidende*, **72**, 841.
Jacob, F. H., and Clapperton, T. (1930). *British Medical Journal*, **1**, 823.
Jones, H. W., and Tocantins, L. M. (1933). *J. Amer. med. Ass.*, **100**, 83.
—— —— (1936). *Trans. Ass. Amer. Phys.*, **51**, 59.
Kaznelson, P. (1916). *Wien. klin. Wschr.*, **29**, 1451.
Lowenburg, H., and Ginsburg, T. M. (1932). *J. Amer. med. Ass.*, **99**, 1166.
—— —— (1936). Ibid., **106**, 1779.
McLean, S., Kreidel, K., and Caffey, J. (1932). Ibid., **98**, 387.
Maingot, R. (1936). *Postgrad. Surg.*, **1**, 809.
Marzullo, E. R. (1933). *Amer. J. Surg.*, **22**, 92.
Mathewson, F. A. L., and Cameron, A. T. (1937). *Canad. med. Ass. J.*, **36**, 141.
Mettier, S. R. (1937). *J. Amer. med. Ass.*, **108**, 83.
—— Stone, R. S., and Purviance, K. (1936). *Amer. J. med. Sci.*, **191**, 794.
Miller, D. K., and Rhoads, C. P. (1936). *J. clin. Invest.*, **15**, 462.
Mondon, H. (1928). *Bull. Mém. Soc. méd. Hôp. Paris*, **52**, 1403.
Myers, B. (1935). *British Medical Journal*, **2**, 445.
Nitis, S. (1930–1). *Ann. intern. Med.*, **4**, 931.
Pancoast, H. K., Pendergrass, E. P., and Fitz-Hugh, T., jun. (1925). *Amer. J. Roentgen.*, **13**, 558.
Patek, A. J., jun. (1936). *Amer. J. med. Sci.*, **191**, 723.
Peck, S. M., Rosenthal, N., and Erf, L. A. (1936). *J. Amer. med. Ass.*, **106**, 1783.
Pemberton, J. de J. (1934). *Amer. J. Surg.*, **24**, 793.
Pollok, L. W. (1936). Ibid., **34**, 340.
Quénu, J. (1929). *Rev. Chir.*, Paris, **67**, 24.
Rudisill, H., jun. (1936). *J. Amer. med. Ass.*, **107**, 2118.
Schiff, E., and Hirschberger, C. (1937). *Amer. J. Dis. Child.*, **53**, 32.
Smith, G. (1936). *British Medical Journal*, **1**, 157.
Spence, A. W. (1928). *Brit. J. Surg.*, **15**, 466.
Stephan, R. (1920). *Münch. med. Wschr.*, **67**, 309.
Vogt, E. (1935). Ibid., **82**, 263.
Whipple, A. O. (1926). *Surg. Gynec. Obstet.*, **42**, 329.
Williamson, B. (1934). *British Medical Journal*, **2**, 488.
Witts, L. J. (1931). *Lancet*, **1**, 809.
Zondek, H., and Kaatz (1936). *British Medical Journal*, **2**, 387.

M. Auguste Lumière has been elected president of the French Association for Researches on Deafness. Further information concerning the Association may be obtained from the general secretary, 143 bis, Promenade des Anglais, Nice.

THE NERVOUS FACTOR IN JUVENILE ASTHMA

BY

A. KERR CLARKSON, M.B., Ch.B.

An investigation of the known aetiological factors in asthma was undertaken in a large number of cases seen over a period of five years.* The present paper briefly summarizes some of the observations made on the "nervous factor" in 187 of those patients, whose ages ranged from 2 to 20 years.

Evidence was early cumulative to show that the psychological element intruded in a varying degree in almost every case, and it was eventually possible to classify its relation to the syndrome according to three factors: (1) the nature of the inheritance and environment; (2) the degree of allergic thraldom; (3) the duration of the condition.

At an early stage of my investigation I was struck by the fact that a preliminary conversation with the parents of an asthmatic child could enable me to assess with surprising accuracy the measure of success which would attend treatment. Further experience made it increasingly obvious that parental invasion of its psychic life could markedly influence the affective states of the child. As Jung points out, "the first form of a complex cannot be other than a parental complex, because the parents are the first reality with which the child comes in contact." This is of supreme importance to our problem because, as I shall later attempt to show, allergy carries with it certain psychological limitations, and the allergic child is often made aware of disordered emotional currents in its allergic parents, and tends to fashion its own reactions in a "preselected" imagery.

What are the characteristics of those reactions, and how are they related to the syndrome? It is only possible to answer those questions when psychological considerations are related to physiological data.

Disturbance from Biochemical Changes

Analysis of the case histories under review shows that in the great majority the ideational pattern of the affective states is already deeply grooved in the nervous system prior to the onset of asthma. Around a primary nucleus of fear is developed a diffuse background of "oversensitiveness" or apprehension. Clinically, this is evidenced by the fact that stimuli which impinge closely on the emotional life of these children appear to excite a diffuse wave of psychic radiation. The normal reciprocal inhibition is hereditarily faulty. The resultant loss of localization of stimuli widens the horizon of apprehension. The decision about what is to be done becomes momentous; the nature of the child's psychic endowment will be the ultimate guide to that decision. A failure in adaptation or a tendency to false compensation will enhance a potential overflow into autonomic channels. But, in my opinion, at this early stage rarely can emotion pervert the machinery of the lower centres until something of a purely physical nature impairs the integrity of cortico-thalamic control. All the evidence suggests that this disturbance is brought about by biochemical changes ushered in by allergy. In 98 per cent. of my cases I have not been able to determine a purely psychogenic cause for the onset of asthma in the absence of other factors. It must, how-

* "A Review of 300 Cases of Asthma in General Practice." (Sir Charles Hastings Prize, 1936.)

ever, be understood that the prespastic emotional life constitutes the basis of later disorder, for from its constituent elements may be eventually forged the dynamic energy of psycho-autonomic activity.

Case 1.—An only child, aged 7, had suffered from allergic bronchitis since infancy. The father was a chronic dyspeptic and the mother had migraine. After the birth of her child the mother seemed to lose a guiding motive in life. Migraine attacks became frequent. The suggestion of a holiday or other form of amusement invariably initiated an attack. Several times a week the child would see her mother incapacitated by headaches. The aura of "over-protection" was later extended to the child. The latter developed measles, which ran a protracted course. During convalescence her appetite became fickle. She wished to be left alone in a semi-darkened room, and at times would weep copiously, stating she had not strength to get up. The mother's anxiety intensified these childish reactions. The little patient was eventually ordered to get up and was dressed. It was then noticed that she was speaking like a child of 2 and walking with a corresponding gait. She was thus recapitulating in her own way those characteristics of infantile regression which appeared in a modified form in the mother.

Allergic Causes of Emotional States

When there is an overstepping of allergic tolerance and asthma ensues a further disturbance of the pre-existing tension states takes place. The most important clinical feature is the lack of psychic "buffering."

In the immediate prespastic stage the child as a rule becomes forgetful and is unable to concentrate. Problems which normally present no difficulty seem insuperable barriers, and the patient becomes irritable and fidgety. The shoulders become hunched forward in an expectant attitude. The normal facial contour is haggard and drawn, and replaced by an apprehensive mask. The child may be taken home from school and submitted to the care of parents whose anxiety not uncommonly enhances the apprehensive aura of the child. It is easy to understand the psychic changes that ensue. Judgement becomes progressively impaired, a turmoil of anticipatory ideas proceeds from strength to strength, and by an association network rendered momentarily freer extends the range of fear memories. Thus it is that so frequently we find bouts of rage and uncontrolled wildness alternating with terror and the assumption of the characteristic spastic posture.

Statistical realism in thought is replaced by a primitive "magical" thinking, whereby affect is detached from the ego and externalized. Every word or action in the non-ego is invested with potential danger. The visit of the doctor and the view of his apparatus are identified with the fear which they might be expected to provoke. "What is this for?" "What will it do?" "Will it hurt me?" "I won't have it!" "I don't like it!" I'll run away!" Two cases illustrate this clearly.

Case 2.—A boy aged 9 developed asthma at the age of 5. He was the eldest of four children. The attacks had occurred at about monthly intervals when I was asked to see him as he had recently become hopelessly unmanageable. On three occasions he had attempted to set the house on fire. Bouts of almost sadistic cruelty to the younger children would alternate with biting and scratching his governess. On my arrival he refused to see me, and hid in the garden. Eventually he was carried by two servants into the house, yelling and biting. After a time I talked to the child quietly, but was unable to carry out any examination. On departing he subjected me to a torrent of abuse, and evolved an amazing scheme for my destruction: "When you come back you won't find me here. I will climb up on the roof and wait for you. I will take up a big stone, a heavy stone, and when you are standing at the door I will drop it on your head." Three months later, freed from allergic thraldom, this patient had become a quiet, well-mannered boy.

Case 3.—A boy aged 10 had a history of allergic bronchitis in childhood. Urticaria and eczema supervened, with hay fever and eventually asthma. He was extremely emaciated, nervous, and emotionally unstable, and the same type of psychical reactions were present as in the former case. His method of avoiding a potential source of recurrent danger was unique. He waited behind a hedge in the drive with an air-gun, anticipating my visit. After four months' treatment by eliminating diets his asthma had ceased and he was able to live as a happy and sociable member of society.

Not merely does clinical evidence show that allergic activity may enhance psychic chaos, but biochemical evidence proves it. The Prausnitz-Küstner reaction, which can be obtained in nearly all those patients, gives positive evidence of the presence in the circulation of sensitization substances, apparently clinically capable of producing gross psychological disorders. Indeed, it is almost safe to assert that at certain times allergic thraldom may bear the same relation to the nervous factor in the asthmatic as does a positive Wassermann to the psychopathology of cerebral syphilis. Yet it would enable us to understand the freakishness of asthma better if we were able to prove that psychological factors could exalt or lower the allergic threshold on biochemical evidence. In this connexion the following experiment may be of interest.

Case 4.—On preliminary investigation an asthmatic girl aged 18 gave a severe cutaneous reaction to an intradermal test for egg sensitization. A wheal one inch in diameter, surrounded by a raised erythematous zone three and a half inches across, developed around the site of inoculation. Next day the test was repeated whilst the patient was deeply hypnotized. The suggestion was given that no reaction would occur. The patient was kept under hypnosis for half an hour and the suggestion was frequently repeated. No wheal developed, and there was no erythematous blush. Sphygmographic tracings of the pulse were taken before and during the experiment. As soon as hypnosis was induced the tracing altered markedly. The excursions became accentuated and more frequent. There was a sharp rise and fall. The predicrotic notch was registered close to the base line. The blood pressure increased from 110 mm. Hg systolic and 65 mm. diastolic to 130 mm. Hg systolic and 75 mm. diastolic. Next day the experiment was repeated in the patient's normal state, and the original wheal was obtained.

Should this paroxysmal overstepping of the allergic threshold continue unchecked a stage is eventually reached where great modification of personality temporarily ensues. The psychological reactions evoked thereby come to dominate the cerebration for the time being, and arouse anomalous conduct disorders, as in the following case.

Case 5.—A medical student aged 19 states as follows: "For several days prior to an attack I have a craving for highly seasoned or unusual food. I tend to smoke a great deal. My powers of concentration are greatly diminished. I begin a conversation but rapidly lose the train of thought. I may stop short in the middle of a sentence, groping for a suitable conclusion which evades me. A few moments later I remember the conclusion and mix it unaccountably in a new group of ideas. These ideas become more and more tinged with emotion. My voice becomes high-pitched, later reaching an almost hysterical scream. I seize upon irrational and illogical facts with frenzied fervour, and attempt to put them over with unjustifiable conviction. Increasing irritability makes me dwell upon ideas of resentment. The fancied slights of friends are magnified and distorted. I remember my enemies with bitterness. Rage begins to riot in my mind. In fancy I see myself a dictator, meting out swift justice to all whom I hate. Mentally, I torture them with sadistic glee.

The knowledge of my helplessness makes me an anarchistic enemy of society. These feelings are very real indeed to me at the time, and yet when the attack is over and I think of them I realize how foolish they have been."

In the course of evolution the flight of anticipatory ideas associated with emotion has been submitted to cortical control in the best interests of the individual. It is difficult to believe that the evolutionary progress could ever have been maintained without this toning down of impulse and emotion by the higher centres. In the asthmatic, however, clinical experience seems to show that this modifying apparatus is in a state of maladjustment.

All the evidence points to the fact that the allergic factor is principally responsible for the onset of juvenile asthma, and that the psychic factor is either mobilized or intensified by allergic states. This conclusion applies only to the early stages of the syndrome. When, however, the condition has continued for some time diffuse psychical reactions centring around the organ inferiority emphasize the pre-existing emotional fears.

Organ Inferiority

The potential asthmatic child enters the world with both a somatic and a psychic handicap. Not merely may it be the victim of an active or passive sensitization from the mother, but of a chromosomal inheritance from the father. It is born into a keenly competitive world, and early environmental influences begin to impinge upon a highly receptive sensorium with invidious insistence. Frequently it is the eldest or only child, and domestic pampering by parents, often themselves the victims of allergic imbalance with its concomitant psychic reactions, directs attention to physical insecurity. Not infrequently the position in the family widens the scope for "over-protection." Moreover, every other incidental illness is a source of anxiety, since by increasing the sense of constitutional weakness it tends progressively to undermine confidence.

In asthma frequent autonomic hyperirritability, initiated by allergy, is an ideal soil for the formation of fear complexes (Emerson).

The direction of attention to the condition lends it emphasis. Physical defects confer on the victim an aura of invalidism, and the psychopathic thinking of his parents may surround him with an almost pathological limelight. Attention becomes focused upon a subject which is daily discussed. "In any situation that is potentially dangerous, fear is present if attention is given to its dangerous aspects" (Rivers).

Fortunately indeed for asthmatic children, though the playing-fields may terrify them their scholastic achievements are of no mean order. About 73 per cent. were far above the average, and seven were dux of their school. Of the remaining 27 per cent. with one exception all were of average mentality and, in the quiescent periods, voracious readers. More and more do they tend to seek the company of much younger or much older people, and gradually acquire an outlook in life far in advance of their years. It is sometimes alarming to find a child of 7 discuss its condition with the matured fluency of an adult. They find an outlet for their latent energies in an endeavour to outstrip in the class-room those with whom they cannot compete in the playing-fields. The feeling of inferiority and isolation demands a compensation, and the time spent by other children in play is utilized by these patients in reading. It is very rare to find a purely autistic attitude to life except in that very small percentage of cases in which asthma occurs in the course of a psychosis.

The Conditioned Reflex

Once the experience of bronchospasm is sufficiently repeated there can be no doubt that it acquires all the characteristics of a conditioned reflex, and at this stage the memory of previous analogous stimuli is adequate to evoke it and eventually is sufficient cause for its persistence.

Once established as a conditioned reflex the potential catalysts, somatic and endopsychic, become numerous indeed. On the somatic side the activity of almost every organ under the control of the vegetative nervous system can eventually be the trigger of vago-sympathetic imbalance. Thus it is that a loaded rectum, a swollen midturbinate, or a distended stomach may initiate a spasm. Correspondingly, the diffuse ramifications in the psyche centralized around the primary emotional nucleus of fear may at any point lead to an attack. This is of great importance from the prognostic standpoint. In some long-standing cases the ideas clustered around asthma may come to colour the whole outlook on life. In such cases future security is to be found only in analysis and sublimation.

"Emotional shocks that are final cannot be forgotten. Many associations recall them" (Kretschmer). Every remembrance may be the occasion for the renewal of the original stimulus through a sensitized set of responsive neurones. Not merely so, but owing to the amazing psychical diffuseness associated agencies may touch the "agitating spot." Anything that will influence a sense organ is convertible into an affective stimulus. This explains why artificial flowers may provoke an attack in a sensitized subject.

Case 6.—A brilliant girl aged 20 had suffered from asthma from the age of 2 years. The patient did not exhibit allied allergic conditions, and physical therapy proved unsuccessful. The possibility of a psychological cause was examined, and the patient was analysed every day for five months and had asthma every night. Eventually it was discovered by hypno-analysis that the cause of her asthma was centred around the terrifying emotions of fear and suffocation when she was assaulted by a negro at the age of 2. The negro threatened that he would cut out her tongue if ever she mentioned the incident. This ghastly experience had been completely repressed for eighteen years. Despite this discovery and the explanation to the patient she was not cured, for it was found by further analysis that the ramification of this early terror had permeated almost every sphere of psychic activity. Her dreams were hypno-analysed for the next sixty-two days, and every occasion revealed that the starting-point of bronchospasm returned to the original "agitating spot." Eventually the negro became replaced by a man with a black beard; he, in turn, by a white man with a swarthy complexion. At a later stage, as confidence was gained, the figure only attempted to frighten her, without assault. In the later stages a form of sublimation was attained, when, in the dream-fiction, she developed sufficient courage to kill her assailant. Once this psychic conquest over fear had been attained her asthma ceased to recur.

Ultimately dependent on the conditioned reflex, there emerge three other characteristics which we may find in the course of the syndrome: (1) purposive simulation; (2) hysterical habituation; (3) voluntary reinforcement.

Purposive Simulation

It must be recognized that in a considerable proportion of cases simulation by arbitrary reflex reinforcement is capable of development. In my opinion this is most frequently determined by parental reactions. The more

intense the emotional lives of its parents the more easily will the child energize the reflex paths with purposive intent.

Case 7.—This patient, a boy aged 11, had a history of eczema and cyclical vomiting, with asthma for three years; sensitized to egg, milk, and fish. After treatment he acquired a new poise in life, took a renewed interest in hobbies and physical recreation, and his physical appearance improved correspondingly. If, however, he received a reprimand or his wishes were in any way thwarted a change at once came over him. The pupils dilated, the shoulders hunched forward, and he threw himself into the posture of "expectant defence."

It must be emphasized, however, that this phenomenon is particularly noticeable when allergic imbalance is intensified, and tends spontaneously to disappear as effective therapy is instituted. The pattern of the reactions alters during treatment, and our psychotherapeutic invasion of the patient's psychical life will be modified in consequence.

Hysterization

A stage may be reached when attacks no longer depend on allergic catalysts. According to the personality reactions of the child, the habituation reflex may be used independent of its allergic origin. Perhaps primarily it is anticipatory. Emotional factors alone may be the "trigger" which excites an attack. It may also be employed as the explosive demand for sympathy, or as a way of escape from unpleasant or undesirable situations.

By extended associations the psyche becomes subjected to an increasing number of involved conditioned stimuli until great complexity and intricacy of behaviour ensues. This fact must be borne in mind when dealing with asthma, for not merely must the patient's allergic background be overcome, but social or environmental maladjustment may require to be corrected. It is perfectly true that removal of the offending allergens may alone enable the patient to attain psychical poise and readjustment, but it is important to stress early recognition and treatment to avoid the habituation reflex which so frequently results. Every time the nerve stimuli traverse a given path they facilitate the passage of later impulses.

Case 8.—A boy aged 12 had had asthma for eight years. His mother died six weeks after his birth. He was brought up in the charge of a devoted "nanny," for whom he cherished a deep affection. His father sent him to Leysin, where he had treatment for two years. He had no attacks in Switzerland, gained rapidly in height and weight, and was sent home assured that the asthma would not return. At school in the South of England he made rapid progress, taking a prominent part in sports. One day his father came to inform him that he intended to marry again. That night the boy had one of the severest attacks of asthma he had ever experienced. The "cure" at Leysin had not sublimated the latent emotional factor.

Arbitrary Reflex Reinforcement of Bronchospasm

This is a phenomenon which may appear in a greater or lesser degree in most asthmatics. It is seldom in evidence in the absence of an audience, is frequently observed in early chronic cases, and reaches its climax in the psychotics. It must be emphasized that its origin is entirely psychological. The more pronounced the latter factor the more readily will the phenomenon appear in emphasis. Its machinery of expression is through the accessory muscles of respiration.

In the presence of bronchiolar contraction these muscles are called into play to assist chiefly the distressed expiratory effort. Should the patient, however, in the presence of anxious relatives, be dominated by the urge to emphasize the distressing nature of his condition he may arbitrarily reinforce the action of the accessory muscles. The expanded alae nasi may be contracted. The sterno-mastoids bulge in accentuated emphasis, the shoulder-tips thrust forward, and the thoracic spines curve markedly. The chest wall is compressed on a rigid diaphragm with compelling insistence. The inspiratory effort is correspondingly laboured with almost masochistic intent.

In this connexion the following case may be of interest.

Case 9.—A youth aged 17 developed asthma after leaving school at the age of 14. His parents had always considered him to be rather "queer." His father was an asthmatic. The patient had numerous jobs, which for unsatisfactory reasons he gave up in melancholy succession. Eventually his asthma incapacitated him from following any employment. For days at a time he would lie in bed wheezing, and he refused food. He became slovenly and untidy in his habits, withdrew more and more from the company of his friends, and developed a morbid introspection. One day I found him asleep: the breathing was quiet and regular. On being awakened he at once assumed the condition above described, and this continued till his lips were cyanosed and adventitious sounds filled the chest. He was sharply reprimanded and ordered to throw back his shoulders and to breathe slowly on command. The sterno-mastoids relaxed, breathing became slow and regular, the strident rales disappeared, and the dusky hue left his lips.

In other cases simpler forms of distraction may suffice to emphasize the fact that such reinforcement of respiration can voluntarily occur. The fixation of the patient's gaze on a bright object above the eyes and the suggestion of calm and quiet breathing displace the respiratory emphasis.

Psychotic Dissociation

In a small proportion of chronic cases (2 per cent.) the motivation is apparently derived from very old and involved complexes. In these cases it is, as a rule, difficult to trace an allergic inheritance, nor do the patients *per se* exhibit associated allergic conditions. Being autistic in temperament and well-nigh divorced from realism, with an intense ego-localization, they live at the level of midbrain philosophy. The deep psychic values of the "retreat into illness" cannot be surrendered to any form of sublimation. I was not able to obtain the Prausnitz-Küstner reaction in those patients. They are non-hypnotizable, and the asthma appears to be of purely endopsychic growth. Psycho-analysis apparently aggravates the condition. Narco-analysis with sodium evipan has been tried unsuccessfully; dietotherapy and insulin injections have proved unavailing. Nor have I found these patients amenable to any form of therapy with which I am acquainted.

Case 10.—This patient, a girl aged 18, the daughter of an epileptic mother, had had asthma for twelve years. She had been bright at school until 10 years old, then became "queer." She believed that a gipsy had cast a spell over her and that she could never recover. Eventually she was placed in an institution. Cutaneous tests gave negative results. The Prausnitz-Küstner reaction was also negative. In my opinion the condition was entirely endopsychic in origin. No success attended therapy.

Nocturnal Asthma

Since most asthmatic attacks take place in the early hours of the morning it seemed feasible that the investigation of the psychological factor might be approached by an analysis of the dream-life of these patients. During sleep the vagus is active, and exhibits a tendency for easier reflex activity. Sleep is associated "with far-reach-

ing effects in autonomic activity," and the first undue prolongation of the normal bronchiolar ripples may be registered in the psyche with a potency denied it at other times. The autonomic centres may have freer play by the dulling of cortical consciousness. Bray suggests that since a child may sleep through a "wheezy" turn the psychological factor cannot play any part in its production. In this connexion the following case is of interest.

Case 11.—A girl aged 5 had had asthma for three years, and developed an attack which was alleged to have followed a reprimand at school. The attack lasted for the remainder of the day, and the child was put to bed and fell asleep with the asthma unabated. I saw her asleep; the wheezing could be heard in the next room. Going quietly up to the child, I whispered the suggestion that she would not awake, that her breathing was becoming quiet, and that she would pass into a normal, restful sleep. Similar suggestions were repeated at intervals of a minute. The laboured respirations began to fade away, the breathing became less audible, and within ten minutes the spasm had completely abated and the child was sleeping peacefully.

The relation of dreams to nocturnal asthma affords much valuable information in this respect. Many psychologists believe that mental mechanisms may be manifested as a purely endopsychic autonomy, while others subscribe to the view that their impetus and direction are initiated by physiogenic disturbance. From my investigations I believe that in asthma both conditions may apply at different times. Thus, hypno-analysis showed that in the early stages of treatment somatic disturbance usually stimulated the dream-pattern. In later stages the dream-fiction was more frequently endopsychic. The reason for this fact may depend upon the progressive stabilization of the vago-sympathetic balance. Thus McDowell concludes that when the body is at rest vagus activity is maximal. Pottinger asserts that potassium and, to a lesser extent, sodium are associated with vagus activity, whereas calcium is identified with sympathetic stimulation.

Undue departures from normal values place the asthmatic in a potentially spastic state. It is so frequently forgotten that cerebral tissue, whereby the psyche is made manifest, must correspondingly share in any biochemical disturbance. It is therefore a diagnostic fallacy to look in the early stages of treatment, except in a few cases, for a purely insulated endopsychic interpretation. Simon states: "If, during sleep, an organic apparatus is in a state of activity, stimulation, or disturbance, the dream will present ideas which correspond with the nature of the organic function performed by that apparatus."

In asthma these stimuli are wont to travel along certain established paths. Reaching the autonomic stations in the mid-brain, they are freed from the inhibitory influence of the cortico-thalamic fibres. A great deal more careful work requires to be done before we have positive evidence that the disinhibitory action of the higher centres in the asthmatic is dependent on a lack of synaptic buffering due to calcium deficiency, but it would almost appear that some such interpretation is feasible. The dreams associated with asthma are almost "pre-selected." Whatever be the artistic imagery woven into them they frequently return to the "agitating spot."

Investigation of nocturnal attacks shows that they fall into three main groups: (*a*) those of purely endopsychic origin; (*b*) the expectation of an attack on going to bed (affective unrest); (*c*) the arousal of the dream-pattern by somatic changes. Hypno-analysis of nearly a hundred dreams was carried out. By this method it was believed that it might be possible to assess with extreme accuracy the onset and nature of the primary stimulus of the attack. In many instances the fear of suffocation or strangling was woven into the dream-pattern with amazing insistence.

(*a*) ENDOPSYCHIC STIMULUS

Case 12.—This patient's dream commenced at 2.15 a.m., and she states: "I was in a long, dark room. The windows were very small and high. Cobwebs were everywhere. The door was locked on the outside. A man came from behind a piano in a corner. He put his hands round my throat and began to choke me. I struggled to escape. I remembered I had a knife in my pocket. I clutched it and wriggled round and stabbed him. He fell to the floor, dying. I rushed to the door and beat on it and shouted. Everything seemed to go tight and taut. I couldn't breathe. I felt I was suffocating. I couldn't get out. I awoke with an attack of asthma." Questioned as to somatic sensations, the patient described that prior to the dream she was lying comfortably on her right side. There was no visceral disturbance and no cough. I interpret this, having respect to all the factors of the case, as a purely endopsychic stimulus.

(*b*) AFFECTIVE UNREST

The "occasion apparatus" suggested by Bleuler continues to function automatically once it is set in motion, provided an adequate stimulus is supplied. Many nocturnal attacks suggest that affective unrest on going to bed is apparently capable of determining the onset of an attack. Adler suggests that:

"This tendency is observed in early childhood; where there is organic inferiority it is of excessive growth. Very often this feeling occurs at the time immediately preceding sleep, and then it is not remarkable that a dream-fiction spurs further this effort of anticipation in a form to cause fear."

The following dream is of interest:

Case 13.—"I went to bed worried about the death of my sister. I didn't sleep for a long time. I fell asleep at 12.7 a.m. At 37 minutes after 1 I was conscious that my stomach seemed swollen. I coughed twice and turned from my left side to lie on my back. I remembered that coughing often brought on an attack. I began to dream that I was alone in an empty house. Plaster was falling from the walls. The roof began to sink in. I tried to escape, but couldn't find a way out. I heard my heart thumping louder and louder. Breathing was difficult. The dust made me cough more and more. I was being suffocated, and I awoke with asthma."

(*c*) SOMATIC CHANGES

The following is a dream illustrative of these:

"I was aware that I was wheezing at 2.5 a.m. I began to dream that I was bathing in the sea. I felt myself sinking, and began to struggle. My breathing was difficult and I felt myself choking. I attempted to fight to the surface, and woke sitting up in bed with asthma."

Summary

Summarizing the psychic factor in juvenile asthma we may accept the following features as common, in a varying degree, to nearly every case:

1. Intensification of emotion as an integral part of autonomic disharmony, by allergic or biochemical factors.

2. In a certain proportion of cases the psychological phenomena in asthma are entirely dependent on a disordered biochemistry.

3. If the latter factor is not adequately treated there tends to be a perpetuation of an intense emotional life, maximal when the allergic imbalance is upset, and the establishment of an habituation reflex the primary nuclei of which are grouped around fear.

4. According to the temperament of the child, this reflex may be used as "a retreat into illness" or a psychopathic way of escape from reality.

5. The sense of organ inferiority can energize emotion into a physical expression.

6. Frequent repetition of the original stimulus leads to diffuse psychic derivatives, which eventually permeate and colour the life of the individual, and can at any point lead to an attack.

7. This factor more than anything else explains the freakishness of asthma.

8. Where the psychic factor predominates therapy is prolonged and uncertain.

9. In a small but definite proportion of cases asthma is the expression of a definite psychosis.

BIBLIOGRAPHY

Blatz, W. E., and Millichamp, D. A. (1935). *The Development of Emotion in the Infant*, Toronto.
Bray, G. W. (1937). *Recent Advances in Allergy*, London.
Brown, W. (1934). *Psychology and Psycho-therapy*, London.
Cannon, W. B. (1929). *Bodily Changes in Pain, Hunger, Fear or Rage*, New York.
Comrie, J. D. (1932) *History of Scottish Medicine*, vol. i, London.
Darwin, C. (1890). *Expression of Emotion in Man and Animals*, London.
Emerson, C. P. (1935). *The Nervous Patient*, Philadelphia.
Freud, S. (1932). *Interpretation of Dreams*, London.
Gesell, A. (1933). "Maturation and Infant Behaviour Pattern," in *Handbook of Psychology*, edited by C. Murchison, 209.
Hurst, A. F. (1929). *Practitioner*, **123**, 4.
Jung, C. G. (1923). *Psychological Types*, London.
Kretschmer, E. (1934). *Medical Psychology*, London.
Morton, G. F. (1925). *Childhood Fears*, London.
Strauss, E. B. (1927). *Lancet*, **1**, 962.
Watson, J. B. (1920). *Psychology from the Standpoint of a Behaviourist*, Philadelphia.

BLOOD BROMIDE INVESTIGATIONS IN PSYCHOTIC EPILEPTICS

BY

LOUIS MINSKI, M.D., M.R.C.P.
Deputy Medical Superintendent, St. Ebba's Hospital

AND

J. B. GILLEN, M.B., D.P.M.
Temporary Assistant Medical Officer

Recently many articles have appeared on bromide intoxication in the neuroses and psychoses, but no investigations seem to have been carried out on the chronic epileptic population of mental hospitals who have been given bromide over a number of years. For this reason thirty-two epileptics (twenty females and twelve males) who had been having bromide for periods ranging from ten years to one year had their blood bromides investigated. It was found that if 90 grains of bromide a day were prescribed, at the end of ten years 6 cwt. of the drug had been consumed, and in this category there were seven patients, while the remainder had had the same daily dose of bromide over a period of four to seven years. In addition many of these patients were taking luminal or prominal.

Katzenelbogen (1932) raises the question as to whether the haemato-encephalic barrier plays a part in bromide intoxication in view of the fact that bromide intoxication may occur with low concentrations of bromide in the blood and, on the other hand, sometimes no signs of intoxication occur with high concentrations. He found in eighty-seven cases in an epileptic colony that the barrier permeability was increased in twelve cases, showed a moderate rise in twenty-four, and decreased in nine, while in forty-two the distribution ratio of bromide between the blood and cerebrospinal fluid was normal. He also observed that there appears to be no relation between the mental state of an epileptic and his barrier permeability to bromide. Other writers (Walter, 1929; Weil, 1927) appear to have found no constancy regarding the permeability of the haemato-encephalic barrier in epileptics.

As will be seen later, many of the epileptics under investigation showed comparatively low blood bromide levels considering the amount of bromide which had been taken, and Quastel and Yates (1934) found that in all patients, independent of their mental states, the blood bromide rose markedly after oral ingestion of sodium bromide, and that the low bromide levels in certain psychotic patients could not be ascribed to lack of absorption of bromine into the blood stream.

The ages of the patients investigated ranged from 68 to 23 years, and the only instances of physical disease were in nine patients who suffered from arteriosclerosis and one who had chronic bronchitis. The highest blood bromide was 275 mg. per 100 c.cm. in a patient of 62 who had been on 90 grains of bromide a day for ten years. Two other patients, aged 64 and 68 respectively, who had had similar doses of bromide over a similar period, had blood bromides of only 150 and 125 mg. respectively. All these patients showed evidence of arteriosclerosis, while younger patients about 30 years of age who had had similar quantities of bromide, and who showed no signs of physical disease, had blood bromides of well over 200 mg. There were no marked signs clinically of bromide intoxication in any of these patients, who were all on similar diets and in whom the chloride intake could be assumed to be fairly general. This would appear to differ from the usual findings of most writers (Barbour, Pilkington, and Sargant, 1936) that older patients and those with arteriosclerosis, renal insufficiency, etc., tend to show early signs of intoxication.

Barbour (1936) states that the greater part of the bromide is excreted by the kidneys, and that the blood bromide level varies with the urinary output, which in turn depends on the fluid intake and renal efficiency. In those patients with arteriosclerosis there was evidence of impaired renal efficiency also, and the bromide was excreted more slowly than in patients who were physically well. This was shown by examination of the blood bromide levels taken at various times after the bromide had been discontinued and chlorides administered. In all cases sodium chloride, 30 grains thrice daily, was given to help in the elimination of the bromide.

Mental States

All of the thirty-two patients examined showed marked intellectual deterioration, with impairment of memory, emotional facility and instability, childishness, and irritability. Many of them were disorientated, suffered from paranoid delusions with auditory hallucinations, and were inclined to have attacks of violence. In addition they were restless, quarrelsome, and revealed the typical "difficult" behaviour of the epileptic. No patients presented in a typical manner any of the symptoms of a toxic confusional state usually associated with a bromide intoxication, nor were any neurological signs found. Although, as stated, several cases suffered from auditory hallucinations and disorientation, no evidence of visual hallucinations was observed. Bromide paranoid states have been reported, but the patients in our series who exhibited this type of reaction showed considerable deterioration also.

Table of Blood Bromide Levels (Expressed in mg. per 100 c.cm. Blood)

Case	Age	Before Detoxic	1 Month After Detoxic	3 Months After Detoxic	No. of Fits 3 Months Before Detoxic	No. of Fits 3 Months After Detoxic
		mg.	mg.	mg.		
1	59	125	25	under 10	1 major	2 major
2	52	75	20	„ „	3 major 1 minor	nil
3	28	100	25	„ „	2 major 1 minor	1 major 12 minor
4	57	100	25	„ „	2 major 1 minor	1 minor
5	37	100	25	„ „	1 major 1 minor	2 major 3 minor
6	23	100	20	„ „	10 major 1 minor	15 major 6 minor
7	45	125	25	„ „	nil	nil
8	30	150	50	„ „	2 major	10 major 1 minor
9	54	75	25	„ „	2 major 1 minor	nil
10	25	150	25	„ „	nil	2 minor
11	37	150	20	„ „	4 major	10 major
12	37	150	30	„ „	4 major	6 major
13	33	200	50	„ „	nil	4 major
14	32	225	50	„ „	9 major	24 major 4 minor
15	50	175	25	„ „	7 major 2 minor	16 major 9 minor
16	38	175	20	„ „	3 major 6 minor	7 major 4 minor
17	24	150	50	„ „	18 major 4 minor	18 major
18	56	175	50	„ „	nil	13 major 72 minor
19	39	175	25	„ „	7 major 3 minor	7 major 5 minor
20	33	100	75	„ „	9 minor	1 major 12 minor
21	37	200	20	„ „	1 major 1 minor	nil
22	52	75	20	„ „	25 major 15 minor	10 major 9 minor
23	24	150	50	„ „	25 major	27 major
24	38	175	75	„ „	nil	4 minor
25	52	150	20	„ „	nil	nil
26	29	25	10	„ „	19 major 1 minor	21 major
27	68	125	50	„ „	4 major 2 minor	2 major 2 minor
28	33	25	10	„ „	23 major 10 minor	16 major 10 minor
29	39	75	50	„ „	5 major	1 major 1 minor
30	62	275	75	„ „	7 major	7 major
31	64	150	50	„ „	2 major	4 major
32	59	200	75	„ „	2 major 3 minor	47 major 23 minor

Comments

Considering the large amount of bromide ingested, the blood bromide levels could not be regarded as being unusually high. In fact, in several cases—Nos. 9, 22, and 28—the levels were surprisingly low, seeing that the patients had been taking 60 grains of bromide daily for seven, ten, and five years respectively. In order to rule out any error the estimations were repeated, and agreed each time, and, as has already been stated, the chloride intake of all patients was fairly constant.

When the blood bromide levels had been reduced to normal the patients' mental states were re-examined. No marked change was found, and it was presumed that the deterioration was organic in type, due to the epilepsy, and did not appear to be increased by the bromide. One patient (Case 21) spontaneously stated that she felt better, and did not feel so dull and lethargic, while the nurses in charge of several patients said that they were less sluggish and slow, and did small tasks more readily than previously. Where hallucinations and disorientation had been present before they still persisted, and in only two patients (Nos. 5 and 12) were attacks of violence more marked. One patient (No. 11), who previously had frequent attacks of violence preceding his fits, had been much more docile since the bromide was discontinued. Those patients who were paranoid before detoxication still remained so.

Regarding the number of fits, in three cases (Nos. 2, 9, and 21) they have ceased altogether, and up to date—namely, six months since the bromide was discontinued—there has been no recurrence. In two other cases (Nos. 7 and 25) where there had been no fits for three months prior to the bromide being omitted there have been no fits since. In none of these five cases have the patients become more irritable or difficult to manage.

Of the remaining twenty-seven patients, ten showed a slight increase in the number of fits, eight a definite increase (of the minor type in some cases), five showed a decrease, and four remained as before. In only a few cases where the fits showed a definite increase in number was it necessary to administer luminal to try and reduce their frequency, and in no case did status epilepticus occur. Various other drugs, such as prominal, benzedrine, amytal, and ephedrine, were tried so as to reduce the number of fits, but with a varying degree of success.

Conclusions

The blood bromides of thirty-two chronic epileptic psychotic patients were estimated, and although comparatively high levels were found in many cases no obvious instances of true bromide intoxication showing delirious or confusional reactions were discovered.

Reduction in the bromide level produced no appreciable change in the mental state, and no marked increase in the number of fits, which were definitely reduced in eight cases.

We wish to thank Dr. L. H. Wootton, medical superintendent, for permission to make use of the clinical material, and also Mr. N. D. Constantine, technical assistant at the hospital, for carrying out the estimations.

REFERENCES

Barbour, R. F. (1936). *Proc. roy. Soc. Med.*, **29**, 1391.
—— Pilkington, F., and Sargant, W. (1936). *British Medical Journal*, **2**, 957.
Katzenelbogen, S. (1932). *J. nerv. ment. Dis.*, **75**, 144.
Quastel, J. H., and Yates, E. D. (1934). *Biochem. J.*, **28**, 1530.
Walter, F. K. (1929). *Die Blut-Liquorschranke*, Leipzig.
Weil, F. (1927). *Schweiz. Arch. Psych.*, **20**, 195.

At the annual general meeting of the People's League of Health, with Dr. C. O. Hawthorne, the chairman of council, presiding, Miss Olga Nethersole presented the annual report. The first national appeal launched by the League had realized some £5,000. A campaign for safe milk which was begun in February, 1930, had been continued, as had many other activities of the League. Dr. W. G. Savage moved, and Sir Walter Langdon-Brown seconded, the adoption of the report. Professor James Young proposed the re-election of members of the governing council and all official members of the League, and Sir Frederick Hobday reported on the council's scheme for the eradication of tuberculosis from the herds of the country. New members elected at the meeting to the medical council were Professor L. S. P. Davidson, Dr. R. G. Gillespie, Mr. W. T. Munro, Sir StClair Thomson, Professor J. A. Ryle, and Dr. G. Carmichael Low. Sir Leonard Rogers was elected a member of the advisory council.

TREATMENT OF OBSTINATE OEDEMA BY MULTIPLE PUNCTURES

BY

MIN SEIN, M.B., M.R.C.P.

Captain, Indian Medical Service, Burma

Cases crop up now and again in medical practice where obstinate oedema defies treatment by medical means. Such cases are seen in the late stages of cardio-renal failure when, apart from the discomfort arising from the oedema, the patients suffer from attacks of nocturnal dyspnoea. Prognosis in these cases is extremely poor, but any treatment which enables life to be prolonged in fair comfort and also reduces the suffering should be welcome. The medical treatment (Christian, 1936) usually adopted consists in the employment of cardiac tonics and diuretics such as the digitalis group of drugs, ammonium chloride, urea, novarsurol, salyrgan, and other mercurial preparations. A light and easily digestible salt-free diet is provided and the fluid intake is restricted. The patient is kept in the most comfortable position for the relief of orthopnoea.

Where the above measures fail to afford relief it will be necessary to consider the removal of the oedema fluid by mechanical means. By this method large amounts of fluid could be removed in a comparatively short time, so that it might profitably be employed in the earlier stages instead of waiting until the system is waterlogged.

According to Bland and White, whose views other authorities share, the mechanical removal produces a threefold result: "first, by reducing the size of the distended parts the patient is made more comfortable; secondly, the already overtaxed and failing circulatory system is relieved of an additional burden; and, finally, the partial removal of what has been called by Galli the 'peripheral barrier' to the circulation favours a more adequate reabsorption of the remaining fluid by subcutaneous veins and lymphatics." Furthermore, it is assumed that the oedema fluid is toxic and possibly acts deleteriously on the vascular endothelium, making it more permeable and creating a vicious circle which is likely to be broken by the removal of the fluid.

Mechanical Methods of Removing Oedema Fluid

The methods in vogue are three in number—namely; (1) the use of Southey's tubes, (2) punctures with a needle, and (3) scarification or incision with a knife. Of these, Bland and White recommend the use of Southey's tubes in preference to the others. They described eight cases in which they had employed this method. Pallasse, using Southey's tubes, had only one case of infection out of ten. Destéfano finds a platinum needle 4 cm. long in each leg satisfactory, and records a case in which 27 litres of fluid were drained off in twenty-four hours. Recently Leech has devised a modification of Southey's tubes which he considers an improvement on the original tubes, because in his experience the latter tend to get blocked after draining for a comparatively short time. The tube is made bigger, and contains ridges on the sides to prevent it slipping off the tissues. Heinecke recommends scarification or punctures, though he admits the possibility of inconvenience and infection by these methods. Hamilton realizes the necessity of the employment of local measures in occasional cases, but does not prefer any one method. Foit is in favour of multiple punctures, and among British authorities Carr wholeheartedly supports this method and considers it far simpler and more efficient than Southey's tubes. Bennett recommends a small horizontal incision over each malleolus. Textbooks of medicine are divided in their preference for the methods to be employed. Hutchison's *Index of Treatment* made no mention of the mechanical means of dealing with obstinate oedema under nephritis and heart failure. From the above it is apparent that the mechanical removal of oedema fluid is accepted as having a decided value in the treatment of obstinate oedema.

Of the three methods mentioned scarification is impracticable for several reasons. One should be chary of cutting down to the deep fascia as has been recommended by Fishberg and Cecil when the tissues are devitalized through being sodden with oedema fluid. Obviously infection would be difficult to avoid; healing is likely to be delayed, and should oedema recur the danger would be increased. It must be admitted, however, that reports of cases in which severe infection has occurred are very difficult to obtain, but Cibils and others have reported a case of gangrene of the genitals caused by generalized oedema in lipoid nephrosis.

Whilst both acupuncture and the use of Southey's tubes are serviceable therapeutic measures, Bland and White deprecate acupuncture for the following reasons: (1) the difficulty of collecting and controlling the fluid that drains away; (2) the risk of infection and ulceration due to constant exposure to irritating fluid; (3) the danger of erysipelas, resulting in the increase of the patient's suffering and acceleration of his death; and (4) constant wetting of bedclothes. To my mind these risks are inherent to any surgical intervention in these cases and are not peculiar to acupuncture. The dangers could be minimized by taking the following precautions. The patient should be propped up on an easy- or deck-chair which has been well cushioned, and the feet placed in a basin supported on a footstool. This eases the dyspnoea by making the patient comfortable; at the same time it promotes the gravitation of the oedema fluid to the legs. The risk of infection is avoided by taking aseptic precautions before the acupuncture, by keeping the punctured areas covered with sterile gauze or lint, and by applying a bland ointment to the skin below the punctures to protect it from the irritation of the oedema fluid. Thus the objections against the employment of acupuncture are easily overcome.

Advantages of Acupuncture

Acupuncture has several advantages over Southey's tubes. The method is easy and does not require the use of any special instrument; little trauma is caused to the skin, and if necessary the punctures can be repeated; the method can be employed in the patient's home, since no special attention is necessary as when Southey's tubes are used. It does not restrict the movements of the patient's legs as when needles are inserted into them. It may be noted that the punctures are kept open by the pressure of the oedema fluid and that the flow of the fluid is controlled by this pressure. It is therefore contended that acupuncture has a definite place in the treatment of obstinate oedema; this method would be particularly useful in the Tropics, where there is little risk of the feet being chilled by the oedema fluid.

The Technique

Having placed the patient in the position indicated, the legs and feet are prepared as for an operation. Methylated spirit is preferred to iodine for sterilizing the skin,

as the latter is too irritant. Fifteen to twenty punctures are made with a triangular skin-needle on the inner aspect of the lower part of the legs and the dorsum of the feet. The needle is placed against the skin and quickly pressed into it, and the point is pushed obliquely upwards into the subcutaneous tissue and withdrawn. The whole movement should be done quite smartly, and is practically painless unless the needle is jabbed into the skin. Veins can be felt and avoided, but bleeding, if it occurs, is easily controlled by a little pressure. Fluid will flow out from the punctures and collect in the receptacle placed under the feet. In male patients the scrotum should be supported by means of a folded bed-sheet placed across the thighs; this will help to reduce the size of the distended organ and render puncture of it unnecessary. If the ascites tends to diminish rapidly it is advisable to apply an abdominal binder as after paracentesis. Light massage of the limbs may be employed to promote drainage and overcome the stiffness of joints. When it is decided to stop the drainage all that is necessary is to put the patient to bed and wrap the legs and feet in an absorbent dressing for two or three days while some oozing from the punctures remains.

Summary

1. Mechanical removal of oedema fluid by acupuncture is a useful addition to the therapeutic measures available for the treatment of obstinate oedema.

2. This method possesses several advantages over the use of Southey's tubes.

3. Certain precautions are necessary to avoid complications; these are stressed.

BIBLIOGRAPHY

Achard, C. (1930). *The Oedema of Bright's Disease*, translated by M. Marcus, London, p. 225.
Bennett, T. I. (1934). *British Medical Journal*, **2**, 929.
—— (1935). *Practitioner*, **135**, 433.
Bland, E. F., and White, P. D. (1930). *J. Amer. med. Ass.*, **95**, 1489.
Cecil, R. L. (1934). *Textbook of Medicine*, third edition, Philadelphia, pp. 977 and 1156.
Christian, H. A. (1936). *New Engl. J. Med.*, **214**, 418.
Destéfano, J. (1923). *Semana méd.*, B. Aires, **30**, pt. 1, 101; Abstr. *J. Amer. med. Ass.*, **90**, 809.
Cibils Aguirre, P., and Saubidet, E. J. (1930). *Rev. de especialid.*, **5**, 1655.
Carr, J. W. (1922). *Lancet*, **2**, 1161.
Fishberg, A. M. (1934). *Hypertension and Nephritis*, third edition, Philadelphia, p. 136.
Foit, R. (1930). *Bratislavské lekars. List.*, **10**, 110.
Hamilton, B. E. (1932). *New Engl. J. Med.*, **206**, 1290.
Heinecke, A. (1921). *Zbl. Herz Gefasskr.*, **13**, 129, 145, 151, 161.
Hutchison, R. (1936). *Index of Treatment*, eleventh edition, Bristol, pp. 604, 606.
Leech, C. B. (1936) *J. Amer. med. Ass.*, **106**, 1895.
Maclean, H. (1927). *Diagnosis and Treatment of Renal Disease*, third edition, London, pp. 110, 122.
McCrae, T. (1935). *Osler's Principles and Practice of Medicine*, twelfth edition, New York, p. 709.
Pallasse, M. E. (1923). *Progrès méd.*, **50**, 654.
Poulton, E. P., and others (1936). *Taylor's Practice of Medicine*, fifteenth edition, London, pp. 277, 527.
Price, F. W. (1933). *Textbook of the Practice of Medicine*, fourth edition, London, pp. 845, 1285.
Southey, R. (1877). *Trans. Clin. Soc. Lond.*, **10**, 152.
Vaquez, H. (1924). *Diseases of the Heart*, translated by G. F. Laidlaw, Philadelphia, p. 641.

A report of the proceedings of the Sixth Joint Conference of Cemetery and Crematorium Authorities, held at Torquay from June 28 to July 1, has now been published. The report includes the addresses and papers read, and can be obtained from the publishers, the National Association of Cemetery and Crematorium Superintendents and the Federation of Cremation Authorities in Great Britain, 47, Nottingham Place, London, W.1, at the price of 2s.

Clinical Memoranda

Tricuspid Stenosis and Pulmonary Tuberculosis

A combination of pulmonary tuberculosis and a congenital heart lesion is sufficiently unusual to make it worth while recording the following case.

A youth aged 19 was admitted to the Hull Royal Infirmary on April 3, 1937, on account of a severe haemoptysis. There had been numerous smaller haemorrhages during the previous year, but he had paid little attention to them. He suffered from a slight cough.

He was born during an air raid and was three months premature. He had always been rather blue in the face, and at the age of 13 had been diagnosed as a case of congenital heart disease. At that time he was not expected to live much longer. The patient, however, was very cheerful, and refused to lead a life of invalidism. He actually played football till quite shortly before his admission. There was no history of any illness suggesting rheumatic fever or bacterial endocarditis.

On admission the patient's temperature was 97°, with an evening rise to 99°; pulse rapid but of good volume, respirations 24 per minute. His cheeks and lips were very cyanosed, while the fingers showed marked clubbing. The apex beat of the heart was in the anterior axillary line in the sixth space. The sounds were heard loudly all over the chest and there was a diastolic murmur with a presystolic crescendo audible particularly well over the mitral area. The percussion note was resonant all over the lungs, but the breath sounds were faint. No clinical evidence of pulmonary tuberculosis was discovered although he was examined carefully several times. No other abnormal signs were elicited. Three days after admission the patient had a further large haemoptysis and died.

Post-mortem examination revealed evidence of active tuberculosis at the apices of both lungs, which contained several small cavities with ragged walls. The pleura in these situations was thickened and adherent. The bronchi and trachea contained much fresh blood and the tracheo-bronchial glands were enlarged. The heart also was grossly enlarged, particularly the right side, which was much thicker than the left. The tricuspid valve was stenosed and incompetent, being covered with numerous firm granulations, but all the other valves were quite normal. There was a patent foramen ovale, which admitted the tip of the little finger with ease. The spleen was three times larger than normal, but all the other viscera appeared natural except for congestion.

Discussion

Congenital tricuspid stenosis is a very rare abnormality and when present is usually associated with pulmonary stenosis and/or a patent foramen ovale. Although in this case the history suggested that the condition was in the nature of a congenital malformation the presence of granulations indicates that it must almost certainly have been of inflammatory origin, and reference to the literature on this subject shows that it is so in a large proportion of the reported cases. Thus in the sixteen cases collected by Rachfuss (cf. Osler and McCrae, 1927) five were due to imperfect development, five were definitely inflammatory, and six were of doubtful origin.

A persistent communication between the auricles is relatively common, the figures varying between 30.5 per cent. (Herxheimer) to 14 per cent. (Adami) (Rokitansky, 1855), but the opening is usually only in the form of a valvular slit, and a definite foramen is much rarer. It has been suggested that a cause of the patency may be a rise of

pressure in the right chamber after birth preventing firm apposition of the valve-like fold from the left auricle, thus accounting for the increased incidence of this abnormality with pulmonary and tricuspid stenosis (Osler and McCrae, 1927). The presence of a patent foramen ovale is in all probability advantageous in these cases, as it allows blood from the pulmonary circulation to enter the systemic side and so eases to some extent the back pressure in the right auricle. This may account for the fact that the patient managed to live to the unusual age of 19, since most of those with severe tricuspid stenosis die in infancy.

The cyanosis of morbus cordis organicus, which was a prominent feature of this case, is usually accepted as being due to deficient oxygenation of the blood; this may be brought about by the abnormal mixing of venous and arterial blood or by mechanical obstruction to the pulmonary circulation, and in this case both factors probably played a part, accounting for the intensity of the cyanosis which was present. Pulmonary stenosis as a cause of cyanosis is well known, and it is probable that tricuspid stenosis, by obstructing the flow through the heart even nearer to the systemic circulation, is more potent still in the production of this particular sign.

The incidence of pulmonary tuberculosis with congenital heart disease has long been a debatable subject, and although such an authority as Rokitansky (1855) stated that tuberculous infection of the lungs did not occur in cardiovascular diseases associated with cyanosis, subsequent writers are not in entire agreement. The subject has been clearly summarized by S. Roodhouse Gloyne (1935–6), who states that the two diseases are not by any means incompatible, although the combination is a rare one. It was stated by Fishberg (1932) that pulmonary tuberculosis was the cause of death in nearly all cases of congenital pulmonary stenosis in which childhood was reached, his suggested reason for this being that a relatively avascular lung provided a suitable nidus for the tubercle bacillus. If this opinion is correct one would expect that tricuspid stenosis, by obstructing the blood flow into the right ventricle, would have the same effect. These cases should therefore fall under the same category, although the number reported is too small for any accurate conclusions to be drawn from the figures available. The most remarkable feature of the case in question is that in the presence of these multiple and extensive lesions the patient should not only have lived to the age of 19, but should have led a comparatively normal existence, even to the extent of playing games such as football.

I am indebted to Dr. G. Eric Lewis, physician to the Hull Royal Infirmary, for his help in the preparation of these notes.

J. R. Blackburne, M.B., F.R.C.S.,
Hull Royal Infirmary. Resident Surgical Officer.

References

Fishberg, M. (1932). *Pulmonary Tuberculosis*, fourth edition, Philadelphia.
Osler, Sir W., and McCrae, T. (1927). *Modern Medicine*, third edition, Philadelphia, **4**.
Gloyne, S. Roodhouse (1935–6). *Tubercle*, **17**, 455.
Rokitansky, C. (1855). *A Manual of General Pathological Anatomy*, London, quoted by S. R. Gloyne.

The Public Health Committee of the Middlesex County Council has submitted proposals for the extension and modernization of North Middlesex County Hospital. The hospital, which at present accommodates some 1,370 patients, is used chiefly for acute, chronic, and maternity cases, and contains wards for mental cases. It is estimated that the proposed scheme will cost £2,000,000.

Reviews

DISEASE AT HIGH ALTITUDES

The Pathology of High Altitude Climate. With Contributions to the Climatology of Highland Regions and to the Constitution of High Altitude Inhabitants. By A. Loewy and E. Wittkower, M.D.Berlin, L.R.C.P. & S.Ed. (Pp. 212. 12s. 6d. net.) London: H. Milford, Oxford University Press. 1937.

The authors have used the term pathology mainly to cover statistics of infectious and non-infectious diseases. There is no morbid anatomy or pure pathology in the book. As the individuals dealt with spend all their lives at high altitudes they must be acclimatized, and therefore their climate cannot be considered a cause of any exceptionally drastic pathological change. The highest altitude under observation is about 16,000 feet, but there is not much information from this level. There is a fair amount of detail for La Paz, Bolivian Andes (12,350 feet) and a good deal of statistics from the highlands (mostly about 2,000 to 6,000 feet) of Switzerland, Spain, South Africa, and Central and South America. The information at hand is, however, by no means complete, and the authors are to be congratulated on the careful and restrained manner in which they have drawn conclusions from their material. Their own many researches were carried out mainly at Davos (about 5,000 feet), which under Professor Loewy has become well known as a research centre.

Among points of special interest are the short stature, muscularity, relatively large chest circumference, and longevity of some of the highland races; Scots and Tyrolese are, however, tall. At Davos the seated height is shortened in relation to the total height. Generally speaking, the volume of air respired is increased, as are also the red blood cells and haemoglobin. Residents acclimatized to any high level are liable to mountain sickness on proceeding 3,000 feet higher.

With regard to statistics, the infectious diseases, with the exception of scarlet fever, are responsible for a large part of the total mortality at high altitudes. The mortality rates for pneumonia are greater at these altitudes than in the lowlands. Also there is an extraordinarily high mortality from acute intestinal diseases. The total mortality for non-European highlands (but not South Africa) is remarkably high compared with European highland regions (except parts of Spain).

The highland climate is of therapeutic value in certain defined cases. We expect the authors are referring mainly to Davos and sanatoria at similar levels when they recommend this climate for patients of asthenic build, constitutional weakness, poor convalescence, post-operative anaemias and those that occur after infectious diseases, bronchial (not cardiac) asthma and other allergic conditions, chronic bronchitis and pleurisies, Graves's disease, acne, impetigo, lupus vulgaris, all forms of tuberculosis of the bones, joints, and glands, and also for the first and second stages of pulmonary tuberculosis. Dryness of the air is considered of importance for the last-mentioned. In the Union of South Africa the mortality from all forms of tuberculosis is half to one-third of that of Central Europe—for example, Switzerland.

The highland climate, such as that of Davos, is contraindicated in extensive pulmonary tuberculosis, in severe cases of intestinal and renal tuberculosis, and in cardiac insufficiencies. Statistics do not always reveal the ill effects upon the heart, probably because

other diseases often terminate life, and these latter, not the former, are stated in the records. There is some discussion over the cardiac effects, and this would have been aided by fuller reference to the extensive animal experiments which have been carried out under oxygen pressures lower than those which exist at the altitudes considered. It is obvious that in such a case full information of what is really happening can only be obtained with the aid of animal experiment, in which the severity of the conditions is somewhat increased; the pathological effects are then more easily revealed, and suspicion that the heart is at a disadvantage becomes certainty.

The arrangement of the book is neat and handy, and the information will be of great use for future reference.

DEXTROSE THERAPY

Dextrose Therapy in Everyday Practice. A Survey of the Literature, 1900-1936, on the Experimental and Clinical Studies Applicable to Medicine and Surgery. By E. Martin, Sc.D. With forewords by W. N. Haworth, F.R.S., and Bernard Fantus, M.D. (Pp. 451; 44 illustrations. 3 dollars.) New York and London: Paul B. Hoeber, Inc. 1937.

In this book an attempt has been made to survey dextrose therapy from all its aspects. The author begins with a short account of the chemistry of dextrose. This is followed by a review of the physiological role of this substance, and then the author discusses both the theoretical and practical bases for the use of dextrose in diseases involving each system of the body. Finally an account is given of the various methods of administration. References in profusion are quoted in each section.

The discussion of the chemistry of dextrose is lucid and brief, and it is clear that in this field Dr. Martin understands his subject, but it is impossible to read the rest of the book without receiving the impression that the author has only a second-hand, or at most a superficial, acquaintance with the conditions he discusses. Perhaps the desire to make the work comprehensive accounts for the uncritical accumulation and discussion of references, but it hardly accounts for the correlations which have been made. It is disconcerting to find the action of pituitrin on carbohydrate metabolism contrasted with the effects of hypophysectomy and no mention made of the action of the "diabetogenic" hormones of the anterior pituitary gland. How it is possible to read over 2,000 references concerning the role of dextrose in the body without encountering the numerous publications of Houssay and his colleagues concerning the action of the anterior hypophysis, or the work of Verzar in connexion with the absorption of glucose, is a matter for speculation.

The most serious fault of this book, however, is its lack of proportion. In an attempt to ascribe importance to dextrose in so many diseases the author has ransacked the literature for evidence in support of his conviction. The result is that a largely erroneous idea is given of many conditions in which dextrose is concerned either secondarily or not at all. In the discussion of dehydration, Addison's disease, stoker's cramp, alkalosis, intestinal obstruction, and shock, justification of dextrose therapy involves such special pleading that the fundamental pathology of these conditions is obscured and attention distracted from essential therapeutics.

It is difficult to see to what type of reader the book can be of use. To the student it will be rendered obscure by the mass of references and the failure to indicate which work is good, which bad, and which trivial; to the practitioner the absence of precise instructions when and where to do what in the relatively rare conditions it describes will rob it of most of its useful claims; to the specialist, whether physiologist or clinician, the errors in the book will appear so numerous as to debar it from serious consideration.

ANATOMICAL NOMENCLATURE

Die Nomina Anatomica des Jahres 1895 (B.N.A.) nach der Buchstabenreiche geordnet und gegenübergestellt den Nomina Anatomica des Jahres 1935 (I.N.A.). By Dr. Fr. Kopsch. (Pp. 103. M.2.50.) Leipzig: Georg Thieme. 1937.

In this treatise the nomina anatomica of 1895 (B.N.A.) are arranged alphabetically and placed opposite the nomina anatomica of 1935 (I.N.A.). After forty years the Basle *Nomina Anatomica* has been amended and brought up to date; certain new names have been added, and others omitted. We owe to Professor Kopsch and his collaborators this clear and concise comparison of the new with the older nomenclature, which enables the reader to see at a glance the numerous alterations that have been adopted. Asterisks and double asterisks have been employed to denote respectively minor and major alterations. These are chiefly concerned with: (1) linguistic corrections; (2) substitution of such terms as "cephalic" or "caudal" for "superior" or "inferior"; (3) the elimination of names of individuals, with the exception of certain celebrities of classical renown who for the time have escaped the axe—for example, Achilles, Burdach, Goll, Gowers, and Flechsig, whose names enclosed in brackets follow the descriptive term. Thus, "tendo m. tricipitis surae (Achillis)." The fresh names belong chiefly to the nervous system, and include those of many of the "nerve tracts" which have come into common use since the publication of the B.N.A. in 1895. These names now indicate, besides the position of the tract, the direction in which nerve impulses are conveyed. Moreover, the nuclei of nerves receiving afferent fibres are distinguished from the nuclei of origin of efferent fibres. Thus the N. terminalis nervi trigemini is distinguished from the N. originis nervi trigemini. Also, the long-overdue change with respect to the name N. acusticus has now been accomplished, and it is called the N. statoacusticus; and the "otoconia" and "maculae acusticae" are termed "statoconia" and "maculae staticae."

Some changes, however, we think will not meet with universal approval. In some cases the craze for obtaining absolute uniformity has led to obscurity in meaning or to quite unnecessary alterations. For instance, the vertical and horizontal parts of the palate bone have respectively been rendered "lamina palatina" and "lamina maxillaris." We also note that the cumbersome and incorrect name "epistropheus" for the axis vertebra has been retained, notwithstanding the criticisms which were made in 1895. The Greek word ἐπιστροφεύς signifies the object which is turned rather than the pivot around which the movement takes place; hence, rightly, the first vertebra of the neck. The name ἐπιστροφή denotes a wheeling or turning movement, such as is made in military exercises. Some alterations which are not actually incorrect are nevertheless awkward and not likely to be generally adopted—for example, in place of the comprehensive term "tunica vaginalis testis" the double name "periorchium + epiorchium" is suggested.

Incidentally it may be mentioned that the I.N.A. nomenclature is limited with few exceptions to the gross anatomy of the human subject, names applying to microscopical structure and embryology being excluded. There is, however, a distinct need for accuracy and unanimity with respect to these two branches of human anatomy,

and it is to be hoped that a movement in this direction will follow the present work. In our opinion many of the new terms which have been adopted in the I.N.A. are excellent, but for the nomenclature to be throughout generally acceptable and truly international it is highly desirable that in any future revision a close co-operation in all the preparatory stages should be obtained between specially qualified representatives of each of the different countries which participate in the work.

CIRCULATORY FAILURE

Heart Failure. By Arthur M. Fishberg, M.D. (Pp. 788; 25 figures. 40s.) Henry Kimpton. 1937.

The essential factor in disease of the heart is its functional capacity, and in this book on heart failure Dr. Fishberg contributes a review of present conceptions on the functional pathology and symptoms which is a masterpiece of compression and clarity. It is a long book, but there is not a redundant sentence, a fact that will not surprise those familiar with the author's *Hypertension and Nephritis*. Because cardiology becomes increasingly a study in abnormal function the monograph may be regarded as a textbook of heart disease of the best type. A comparison with standard works of only ten or fifteen years ago shows how rapidly views on the mechanism of circulatory failure are altering and expanding. Although at that time the prime importance of the state of the myocardium was appreciated, the arrhythmias and valve lesions were still given a prominent place. To-day, in assessing the state of the heart, these conditions are regarded as still less important, and the tendency is to determine so far as possible the anatomical and functional alterations not merely in the organ as a whole but in the individual chambers.

Views on the way in which the symptoms of heart failure are produced have altered radically in the last decade, largely as the result of studies on cardiac output, velocity of blood flow, venous pressure, vital capacity, and the circulating blood volume. The bearing of these observations on the problems of the clinician are clearly explained by the author. Shock or peripheral circulatory failure is usually of non-cardiac origin, but it occurs in some forms of heart disease and is rightly included in this book, especially as it is important that it be differentiated from heart failure, the treatment of the two conditions being in general diametrically opposed. The therapeutics of heart failure proper occupy about one-sixth of the book. No sounder or clearer review of all the important modern work on circulatory failure has been published.

NURSING PRACTICE

A General Textbook of Nursing: A Comprehensive Guide to the Final State Examinations. By Evelyn C. Pearce. (Pp. 884; 176 figures. 15s. net.) London: Faber and Faber. 1937.

The establishment of a State register of nurses has had wide effects. Perhaps one of the most important has been the consequent change in the character of the training of the prospective nurse. It is no longer enough for her to learn the duties of her future profession by oral methods, by observation, and by repeated trials and lengthy practice. All these must still be done; but it is now necessary that this knowledge and capacity should be so clearly arranged within her mind that on the fateful day of days of the final State examination she will be able to put down upon paper an intelligible answer to the questions set. A "born" nurse must now also be a knowledgeable nurse; hence the recent spate of textbooks designed to serve the needs of the probationer in her studies. Of these *A General Textbook of Nursing*, by Miss Evelyn Pearce, Sister-Tutor at the Middlesex Hospital, is without doubt one of the best. As its subtitle indicates, it is "a comprehensive guide to the final State examinations," and in its eight hundred or so pages it gives as good, as clear, and as useful an account of the work of the nurse as we have read. Miss Pearce in her introduction strives to impress this spirit upon her readers: "The latest advances in medical science are brought to the bedside by the doctor; let the nurse see that her part is to provide, in full measure, the healing touch of human sympathy. The smallest service done to the lowliest possesses an eternal value." And again: "So much depends on the attitude of the nurse who receives the patient, since she by kindness and thoughtful sympathy can change the picture and dispel most of his fears."

In this same spirit the author has striven to put clearly and sympathetically before her readers pictures of the nurse's many-sided work. It is obvious that she is trying (and successfully) to make the probationer see with her own well-trained eyes. The character of the illustrations, of which there are many, is an indication of this endeavour. Each section of the book contains photographic reproductions of the instruments, dressings, and other appliances needed by the visiting doctor for the examination, treatment, or dressing of the particular case, all of them clearly labelled and described. The illustrations give in a most serviceable form a glimpse of the preparation of the ward, the theatre, or the examination-room.

Miss Pearce is to be congratulated on her work. It will be of good service to her junior colleagues.

Notes on Books

The World of Science, by F. SHERWOOD TAYLOR, Ph.D., B.Sc. (Heinemann, 8s. 6d.) contains 1,064 pages packed full of useful and interesting information about the mysterious universe in which we live. The first part of the book, on states of matter, deals with such things as matter and energy, the patterns of atoms in solids, liquids, and gases. In the second part, entitled "Power," there are chapters on simple machines, electric currents, power, and locomotion. Parts III and IV are devoted to "waves" and chemistry respectively, and, following the plan of the Book of Genesis, the author then proceeds via "The Earth and Heavens" to a section on "Life." In this last part of the book he gives, in just under a hundred pages, an admirably clear account of how the body works, and the information is remarkably up to date—no mean feat when the scope of the book is considered, covering, as it does, the whole field of science. The 677 illustrations are well chosen and greatly assist the reader, the line drawings being especially well done. Altogether, this volume is a successful venture on the part of both author and publishers, and would make a welcome Christmas present to the young and also to the adult who still retains enough curiosity to want to know what it is all about.

We have received a copy of the *Proceedings of the Paediatric Congress*, organized by the Cuban Society of Paediatrics held at Santiago, Cuba, from April 10 to 12 (Havana, Molina y Co.). A large number of subjects were discussed, of which the principal were alkalosis, abdominal tumours, orbital cellulitis, diabetes, orthopaedic treatment of infantile paralysis, clinical examination of the endocrine system in children, the blood pressure between the ages of 6 and 12, and cerebral tumours in childhood. A history of the Cuban Society of Paediatrics is prefixed to the volume.

Preparations and Appliances

THE MULTIPLE SEDIMENTOMETER

Dr. TERENCE LEE (London, S.W.18) writes: Since the publication of my article on the sedimentometer (*British Medical Journal*, 1936, **2**, 809) the manufacturers have produced a satisfactory type of multiple-tube sedimentometer (Fig. 1). The working principles of this new apparatus are unchanged in that an image of each tube is focused through a vertical slot on to a moving light-sensitive surface. The advantages of the single-tube machine are thus retained, and the meniscus is seen as a thin white line above; the millimetre graduations on the tubes are recorded and, however fast the sedimentation rate, the margin between the supernatant plasma layer and the settling red cell layer below is always sharply defined. Furthermore the mechanical parts (stage, motor, etc.) are essentially the same. The apparatus thus retains its compactness, while economy has been achieved in the cost of production.

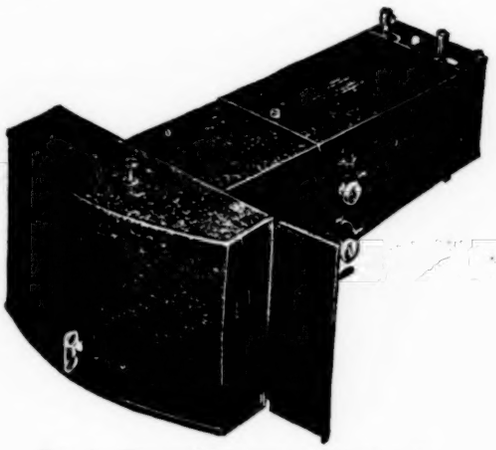


FIG. 1.—The multiple type sedimentometer.

The multiple sedimentometer differs from the original apparatus in that four separate tube images are focused on a single negative (quarter-plate). The magnification has been reduced to one, but although the pictures are smaller the actual height of the supernatant plasma column can be read off direct from the photograph by using an ordinary millimetre scale. This same scale may be used for measuring off time intervals, as 30 mm. on the ordinate in each picture represents a period of one hour. In addition the sedimentation curves or sedigraphs obtained conform to the well-established standards set up by Cutler.

The method of loading and working the multiple-tube sedimentometer differs but slightly from that of the single model. Ordinary plate-holders are loaded with either films or bromide paper. One of these is then inserted through the side door into the moving stage at the back of the apparatus, and while the covering slide of the plate-holder is being withdrawn the stage with the holder is held securely by a locking pin, which is automatically released on closing the side door. This ensures that the film is always in the same position at the commencement of exposure, and is an important point if time markers are to be recorded on the photograph coincident with exposure of the sedimentation tubes (see below). The sedimentometer is then left until the specimens of blood are taken and run into the tubes. These are placed in the holder behind the exposure window, the lens shutters opened, and the clockwork set in motion by pulling out the stop pin above its mechanism.

It is not necessary to expose all tubes simultaneously (although this is preferable); other tubes may be added during a reasonable period after beginning exposure of the first tube. Furthermore, as separate lens shutters are provided, tube slots that have not been exposed may be used later after resetting the stage. After exposure, at a time convenient to the operator, the lens shutters are closed, the motor stopped, and the stage returned to its original position by rewinding the clock. The covering slide is reinserted into the plate-holder, which is then ready for unloading. Means are provided for identifying each of the sedigraphs by numbers engraved on the holder. After development duplicates are made by photographic printing or by visual copying on to graph paper. The prints can be cut up and pasted like large postage stamps on to the case sheets of the patients. In using both single and multiple type sedimentometers, time intervals represented by vertical white lines on the negative are recorded on the sedigraphs by placing in front of the unexposed film or paper a transparent celluloid sheet marked with thin vertical lines so arranged that each passes the light slot at ten-minute intervals (Fig. 2).

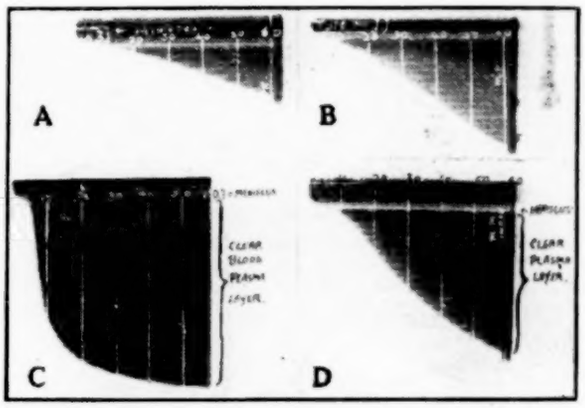


FIG. 2.—Sedigraphs illustrating the various stages of activity in pulmonary tuberculosis. Each picture records the vertical time markings referred to in the text.

(A) Sedimentation index = 7 mm. (A sedigraph just within the upper normal limits for men.)

(B) Sedimentation index = 16 mm. (A mild "diagonal curve" sedigraph, indicating low-grade activity.)

(C) Sedimentation index = 28 mm. Cutler sedimentation time = 30 minutes. (Very active disease.)

(D) Sedimentation index = 21 mm. Vertical curve indicates markedly active disease.

A brief reference to the scope of the multiple sedimentometer would not be out of place. It only requires a quarter-plate sheet of paper for four recordings, and the method of daylight loading is simple. It does not need any special lighting for exposure, and will fit into any odd corner. After the medical officer has obtained the blood specimens an attendant can be trusted to complete the process, as any carelessness, such as inaccuracy in filling tubes, can be detected in the photographs. No special time need be set apart for the sedimentation tests, nor is it necessary to wait until enough cases have accumulated before recording their sedimentation rates. On the contrary the test can be made during routine clinical examinations or at any other convenient time. Finally, several readings of a sedimentation rate are more valuable than a single one. These are provided by the sedigraphs, which give a more vivid impression of the variations of the sedimentation phenomena than a series of numerical readings taken at different intervals.

Besides the helpful suggestions of many friends, my thanks are due to the manufacturers, The Ellis Optical Co. of Croydon, and to Messrs. Hawksley and Sons Ltd. of 17, New Cavendish Street, London, W.1, who are prepared to supply the sedimentometer or any further information on the subject.

"HEALTH WITH HAPPINESS"

LORD HORDER'S SPEECH AT LEEDS

As part of the national health campaign Lord Horder addressed a meeting in Leeds Town Hall on October 15. The following is an abstract of his speech.

Health Services: The British Way

This campaign, this drive towards national health, begins by advertising our health services, services which I believe to be, *potentially*, the best in the world. They are so good that had they been conceived and constructed in Italy or Germany or Russia there would have been films and pictures and broadcasts long ago to tell the people what magnificent things were being offered and done on their behalf.

As it is, being Great Britain, the health services have evolved gradually and quietly, and we have achieved a mass of benefits which, elsewhere, it has taken battles and murders and the subjection of personal liberty by dictators and executives to achieve. But it is also British to clamour for reforms and then, when we have secured them, not to avail ourselves of them. We have done this with the franchise; even the women have done it; and we have done it with the health services. We retain our freedom to grouse; in this country we *can* grouse—and still live!

The Minister of Health is one of the most successful publicists and propagandists we have. He "made good" in another great Government Department, and I believe he will make good in his present job also. If he does he deserves all the success that comes to him. Although Sir Kingsley Wood would be the first to recognize that the magnitude of the two tasks is very different, I think the old adage, "Blessed are the uses of advertisement," applies to them both.

Propaganda for Fitness

When we come to consider what form the advertisement should take in the matter of making a fit nation, I agree with the Minister that he should first tell the people what they can get and how they can get it, and we should tell them through all the media that are available. But it is vital that we make it extremely simple and that we eliminate all complications and duplications. As I pointed out the other day, the health services are magnificent when viewed from the centre; but it is at the periphery also that we need energy and patience and a knowledge of the human material in order that this splendid machine shall get its benefits "across."

When we have done our best to advertise the health services we shall give similar publicity to the new Advisory Council for Physical Training. It is most important that these facilities be made the utmost use of. There is a good deal of rather unfair criticism about the teaching of physical jerks to underfed citizens. We must not forget that there are a lot of overfed citizens for whom some physical training would mean salvation, both of body and of mind. Let us be fair. The Minister of Health is making an advance on different fronts, and with different sorts of armament. But the objective is the same. The crusade assumes two things—the will to be fit and a modicum of intelligence. If we sit sullenly at home when healthy recreation is offered out of doors, and we are the sort to benefit from it, we are performing an anti-social act; and if we take home a leaflet from the post-office on the rearing of babies when we haven't got any, we don't help ourselves to be fit—even though suggestion is sometimes a helpful form of treatment. Everybody must choose the method of achieving fitness which is most applicable to his needs, and if he doesn't know which is most applicable he should ask the doctor. The doctor cannot supply the *will to be fit*—though I don't want to limit his capacity even here—but he can supply the intelligence.

A Ministry of Health that really functions, as ours does, must claim the whole of a doctor's allegiance and all the energy that he can give to see that it functions 100 per cent. But national fitness demands more than this. Even if the present health services did function 100 per cent, we should still be a long way off the attainable standard. I am sure that the Minister of Health does not take so narrow a view of national fitness as that. And I am equally sure that he would be surprised if I did not enlarge the field of inquiry and of suggestion in regard to this vital matter.

A Working Definition

It is very difficult to define fitness, and yet we all recognize the fit man, woman, and child when we see them. Certainly fitness cannot be measured by length of life. I agree that the health services have been chiefly responsible for adding considerably to the expectation of life. And the Prime Minister expressed this in a telling way, when he launched this health crusade, by saying that the length of life to-day is nineteen years longer than when he was born. But, as I am frequently reminding people, this mere prolongation of life isn't fitness. So far as a definition can be attempted, fitness is health plus happiness, and neither of these is necessarily achieved by extending the duration of life. I shall take it for granted that old age is not what we are aiming at, nor even sheer animal vigour. The man who says, "Gosh! I'm fit this morning," is not expressing a satisfactory state of his muscles merely, nor even of his liver; he is expressing satisfaction with life. That is the sort of fitness we want. And that is the sort of fitness the statesman, rather than the politician, really desires for his country.

Essential Ingredients of Health

The ingredients of optimum fitness are really very simple. But we have so complicated our lives that we have mislaid some of them, and we must go back and pick them up again. Some of them are really essential if we want to avail ourselves fully of our health services. I have stated, and restated, these simple ingredients. And yet I must risk boring you by repeating them. Enough of the right food; shelter, which includes clothes and warmth; a job of work; access to the fresh air and such sun as our climate yields; leisure for play of body and of mind—these are the essential things, concerning which there must be some feeling of security before the great advantages of our fine health services can be fully made use of.

So far as my essential ingredients for health are concerned, it would be foolish for me, as a doctor, to pretend that Mrs. Jones and her husband don't suffer from, say, indigestion because of worry—difficulty in getting enough food (let alone the right food), twopence more on the price of tea, and other anxieties—as much as from their ignorance of the health services or what sort of physical exercises are best. It would be foolish. And Dr. Robinson, who is family friend as well as doctor, seeing Mrs. Jones in his surgery, doesn't say *first*, "You should make more use of the health services." If he's a typical G.P. he asks, rather grimly, "Have the kiddies got enough to eat? Are you still spending money on that quack medicine or that patent food? Don't worry; Fred will soon get another job"—and so on. *You* know; well, we *all* know. But at the same time the Joneses are taxpayers, directly or indirectly, and the health services are not a charity; they are paid for by the country. We must urge people to overcome their apathy and their hostility, and we must tell them exactly what is available

for them, whether it is the milk in the schools, the services of the doctors, the care of the welfare centres, or whatever is applicable to the Joneses' case.

Economic Factors in Hygiene

It is quite clear to me that, as I have more than once pointed out, you cannot separate the health problem from the economic problem. The doctor cannot do this in his private consulting room and surgery, and the Ministry cannot do it in the nation at large. For the simple reason that in the last resort it is the individual unit, or perhaps even more important, the *family* unit that presents the problem in each case. Now it is not the business of us doctors to solve the economic problems of the nation, but it *is* our job to know about health. And if we are not quacks it is the duty of statesmen to listen to what we have to say.

The Prime Minister told us at Scarborough a week ago that he could not promise any reforms until we had got further on with our preparations for the defence of the nation. The suggestion is that we must see to it that our boot is strong enough to make our kick effective if, and when, the mad dog attacks us. We cannot escape the stern logic of this argument. I take Mr. Chamberlain's statement to mean that he sees no chance of paying out money for those specific measures which might adjust the lag that exists between economics and national health questions. This lag is most marked in the matter of food. Until the right foods are made more readily accessible to the people one of the main factors in national fitness will not have been dealt with.

Food and Fitness

I use the word food rather than the word nutrition. We doctors know a good deal more to-day about the principles governing nutrition than we did even a few years ago. But the medium through which the principles of nutrition operate is *food*. Not food chosen by experts and weighed out by chemists, but a good supply of mixed fresh food. Make the mixed diet accessible and nutrition will look after itself. Food first, and then some plain, homely instruction upon what to do with it, and how to cook it, and how not to waste it. Here is work for energetic and trained women, women who can organize and who can teach. And there are such women available.

I know the Ministry of Health cannot perform a miracle and feed the multitude by an edict from Whitehall. But when such a miracle did once happen you will remember that a dozen men picked up the fragments of bread and fish that remained, and, no doubt, fed still more hungry people with them. *We* throw our herrings back into the sea, or, nearly as wasteful, we dig them into the earth as manure. The problem of food distribution does not seem to be solved so well to-day as it was 2,000 years ago. But then, life has become much more complicated since that time. We must not blame the Minister of Health for these things. It is only because we are accustomed, in this country, to face the whole issue, and not merely a part of it, that I draw attention to them. But certain it is that if we are going to face up to the whole position, then, at some time or other, we must close the gap that now exists between the economic and the hygienic parts of our task.

Extension of Medical Benefits

But even if we only look at the hygienic part, still taking the broad view of this matter of national health—as we doctors do—there is a whole heap of things that must come, and if they can only come slowly let us hope it will not be too slowly!

There is, to begin with, the extension of medical insurance benefits to all dependants of the worker, not merely between the ages of 14 and 16 as we are promised. Let us hope that that very British phrase, "the inevitability of gradualness," may not be applicable to this most desirable step forward. If this step were taken the doctor would be put on his honour to keep the worker's children well, not merely to get them well when they fall ill. We should in this way recruit every panel doctor into the ranks of preventive medicine, and interest him much more than is the case to-day in activating the health services for the use of the whole family. Health services have been so planned that the term "family doctor" has become, in many parts of the country, a farce. The doctor should be paid to keep the family fit, not paid at the rate of so much a year to attend the head of it when he is ill. The doctor then becomes a real link between the health services and the family for whom they exist. He can plead on their behalf, nay, if necessary he can *demand* the services they specially require.

The Doctor's Work in the Future

And if it be advanced that the doctor's training has not, up to now, fitted him for work of this sort, then the sooner it does so fit him the better. Inevitably the doctor's work in the future will be more and more educational and less and less curative. More and more will he deal with physiology and psychology, less and less with pathology. He will spend his time keeping the fit fit rather than trying to make the unfit fit. And we must make it worth his while to do this work. This reorientation of his education, and of his work, is overdue, and it will remain overdue until reorientation takes place in the attitude of the health authorities towards him and towards his sphere of usefulness. And we must not think his education is finished for all time when he becomes qualified. It is a duty we owe to every doctor to enable him to get back now and again to the stimulating and informing atmosphere of the wards and the laboratories, and, no less helpful, to the atmosphere created by his colleagues and teachers.

This means spending more money, of course, but I cannot conceive how money could be better spent, and, as a long-time investment, I believe it would pay over and over again. For, to repeat, it is at the periphery, and not only at the centre, where energy and knowledge are required. The doctor is the expert who makes contact with the individual, and acts as the conducting medium between the individual and the facilities afforded by the health services through the local authorities. And not only the health services. There is this important matter of physical training and recreation. Grants are good and sergeant-majors are useful, but the doctor's training is essential to a proper use of physical methods in the production of national fitness. And so also in the equally important teaching of the proper selection, and the proper preparation, of food.

If economics has let us down—and it seems as though it has—medicine must do what it can to hold the fort until economics comes once more to its help.

The sessions of the fifteenth International Congress of Ophthalmology will be held in the Semiramis Hotel, Cairo, from December 8 to 14, the subscription fee for members being fifty Swiss francs and for ladies and other associate members twenty-five francs. Residence will be available in the hotel, which will be specially opened for this congress three weeks before the usual time—namely, on December 1. *En pension* or bed and breakfast terms, as desired, are obtainable. A summary of the scientific communications will be distributed before the meetings of the congress. Arrangements are being made for visits to historical monuments and museums in Egypt, for various excursions, and for special social functions. Details of these may be obtained from the general secretary of the congress, Dr. M. Tewfik, P.O.B. 2001, Cairo, Egypt.

BRITISH MEDICAL JOURNAL
LONDON
SATURDAY OCTOBER 30 1937

THE IMMUNOLOGY OF STAPHYLOCOCCAL INFECTIONS

While it is useful from time to time to review any accumulated knowledge, it is particularly so when this has been acquired in a somewhat recondite sphere and yet has very general applications. Few of those whose lot it is to treat staphylococcal infections almost every day can have been able to follow the manifold developments in the study of these infections during the past few years. Hence the review by Professor J. W. Bigger, which appears on page 837 of this issue, is of particular value. He traces, first, the causes which led to the neglect of this subject throughout a period during which other bacteria were receiving a full share of attention. Although the operation of these causes is plain, it is perhaps still to be wondered at that nothing less than the Bundaberg disaster served to revive interest in toxins of which the existence had been known for almost thirty years. During the whole of this time immunity in staphylococcal infections had been supposed to be anti-bacterial: the effect of recent research is the belief that it is mainly antitoxic. A supposed opsonin, which encourages phagocytosis, has given place to anti-leucocidin, which neutralizes a substance lethal to leucocytes; in the immune subject leucocytes are not so much stimulated to act as merely protected from destruction.

With this intimate mechanism and with the properties and individuality of staphylococcal toxins few but interested bacteriologists will wish to concern themselves deeply. The practical result of their study has been to furnish two new therapeutic weapons—antitoxin and toxoid. Those who have given staphylococcus antitoxin a fair trial are mainly agreed that in grave and threatening infections it has undoubted value; in established septicaemia or pyaemia the task may be beyond its powers, although the enormous doses recommended by enthusiasts such as Dolman are said to be effective even in these conditions. Unless sulphanilamide fulfils hopes which are based at present only on experiment, antitoxin is the only specific remedy available for grave and acute staphylococcal infections. The position of toxoid, which is used for active immunization in chronic infections, is somewhat different, since it has a rival in vaccines, which were almost universally employed for this purpose before the introduction of toxoid and still are. The more amenable forms of chronic infection, such as boils and blepharitis, undoubtedly respond to either treatment, while the more resistant, such as sycosis, respond as a rule poorly to either. But it is not to be concluded from this that two quite distinct methods of immunization are equally effective, because vaccines prepared in the ordinary way contain toxin as well as bacterial cells, and to prove that anti-bacterial immunity is sufficient in itself it is necessary to use a vaccine washed free of toxin. When this has been done, as in the experiments of Kitching and Farrell,[1] vaccine has been shown to be inferior to toxoid as an immunizing agent. On the other hand it seems scarcely justifiable to conclude that the bacterial element in the agent used is valueless, and there is much to be said for combined treatment with both. One fact which has clearly emerged from a mass of clinical observations is that anti-haemolysin titrations are useless as a guide to treatment. This antibody is readily estimated, but its concentration in the blood appears to bear so little relation to effective resistance that its behaviour is not a profitable object of study.

A great deal more is certainly known about the mechanism of resistance to staphylococcal infection and treatment has become more rational and more effective, though how much more effective it is difficult to say. But the study of individual toxins and the possibility of neutralizing them is far from laying bare the whole secret of staphylococcal pathogenicity. Anyone who is tempted to think that these investigations have reached finality, and that mere improvement in the quality of toxin preparations is going to secure dependability in immunization, will do well to ponder two observations made by Forssman.[2] In this author's studies of immunization the criterion of success has been protection against an intravenous dose of virulent culture which is regularly fatal in controls within twenty-two hours. By no means whatever—whether with toxoid, vaccines, or with repeated doses of living culture—could he produce resistance to much more than ten times this minimum lethal dose. When this limited effect is contrasted with what can be done with streptococci and pneumococci, to which animals can be made a million times more resistant, it is clear that some radical difference exists in the nature of the infections. His other most significant observation is this. Temporary recovery from the effects of intravenous inoculation with living culture is not accompanied by the immediate destruction of all the injected cocci; they may survive for days in the kidney

[1] *Amer. J. Hyg.*, 1936, **24**, 268.
[2] *Acta path. microbiol. scand.*, 1936, **13**, 453, 459.

and still longer in bone, particularly in the vertebrae, where a chronic osteomyelitis may lead to paraplegia. A rabbit may develop this lesion in spite of vigorous humoral immunity, such that a small dose of its serum will fully protect another rabbit against a lethal dose of culture. Here in a clear-cut form is the experimental parallel to a frequent clinical anomaly. In spite of procedures which should raise the concentration of serum antibodies to the highest possible level, infection often persists. We cannot complacently assume that humoral immunity is the whole story: we are forced, in fact, to conclude that it is not. That it is necessary there is no doubt, but something else of which we have scarcely an inkling takes part in disposing of the invader, and the study of this infection—and indeed of infection generally—will have taken a great step forward when the nature of this other factor is brought to light.

MEDICAL USES OF RADIUM

The latest radium report issued by the Medical Research Council is the fifteenth of a most valuable and useful series, in which are summarized year by year the results obtained at some twenty centres holding radium on loan from the Council. Here both clinical and experimental work is controlled by the Radiology Committee, which has been largely instrumental in advancing radiotherapy in this country from a more or less crude empiricism to its present position of an established branch of medical practice based upon definite scientific principles. This has largely been effected by the cordial and loyal co-operation of the Radium Commission and the British Empire Cancer Campaign, both of which have consistently supported the Council's policy of concentrating their supplies of radium at a limited number of institutions in different parts of the country. Centralization of this type has been eminently successful, since it not only places adequate means of treatment and research in competent hands but also ensures the provision of suitable laboratory facilities, without which further progress would be impossible. Careful attention is also given to the standardization of records, which is one of the most important factors in assessing the values of different forms of radium treatment.

A new feature of the report for 1936, of which an account will be found at page 867, is the inclusion of a section dealing with the use of massive radium units. So far as can be seen at present the results have been highly satisfactory, but of course time is necessary before a final judgement can be passed upon the permanence of the curative effects so far obtained; the outlook, however, promises well for the future. The experimental work has been mainly concerned with the important questions of radio-sensitivity, dosage, and the administration of lethal doses of radiation to neoplasms with a minimum damage to healthy tissues. It has long been known from clinical experience that the skin possesses great powers of recovery from the effects of radiation, and also that damage can be materially reduced by dividing the dose. The investigation of the most advantageous intervals between treatment as well as the exact details of suitable individual doses is thus a matter of urgent importance, and to this a large amount of attention is being given. Information upon the methods of action of radiation on living tissues, both normal and malignant, is constantly accumulating, and the experimental results continually find their application in practice.

The whole series of reports on the medical uses of radium forms such a valuable and interesting record that we venture the suggestion that a comprehensive index to their contents would be of the greatest assistance to those who are engaged in serious research work, either of a literary or an experimental character. The preparation of these reports for the Press is not the least among the many notable services which Professor Russ, the secretary of the Radiology Committee, has rendered to the cause of British radiotherapy.

PSORIASIS

The problem of psoriasis still continues to exercise the dermatologists, and recently Lane and Crawford[1] have approached it from the statistical side, deriving their material from the patients of the Massachusetts General Hospital, while Rosen, Rosenfeld, and Krasnow[2] have examined the theory recently put forward that this disease is associated with faulty lipoid metabolism. The test adopted was the estimation of cholesterol in the blood, the normal figure being given by these authors as 228 ± 26 mg. per 100 c.cm. of serum. They found that the value for patients with chronic localized psoriasis, and for those with psoriasis affecting the nails only, were comparatively low and seldom exceeded the normal quantity; they also observed that the more extensive the psoriasis and the more active the scaling the lower the cholesterol content of the serum. The greatest tendency to the reduction of cholesterol in the serum was found among persons suffering from lesions of the nails only. They concluded that psoriasis is associated rather with hypocholesterolaemia than with hypercholesterolaemia, and they suggest that this is because the cholesterol of the serum is removed to the affected areas. Other observers have claimed that when cholesterol is administered to psoriatic subjects there is no increase in the cholesterol of the serum, whereas in normal individuals an increase can be detected. For

[1] *Arch. Derm. Syph.*, Chicago, 1937, **35**, 1051.
[2] Ibid., p. 1093.

this reason low fat diets have been recommended in psoriasis. Rosen and his collaborators have attempted to test this theory by administering cholesterol to a series of psoriatic patients and a control group of normal individuals. In contrast to previous workers they found that the effect of intake of cholesterol on the blood was extremely slight, and was much the same in both the psoriatic and the normal subjects. Hence they conclude that this test affords no basis for the assumption that lipoid metabolism is disturbed in cases of psoriasis. Lane and Crawford's statistical study confirms for the most part the generally accepted ideas on psoriasis. A few points of difference may be mentioned. For example, psoriasis is not supposed to be a pruritic disease, but they found pruritus present in about 33 per cent. of their patients. With regard to the patients affected by the eruption they find that the arms are most frequently attacked. This conclusion, of course, will not be unexpected, but it is rather surprising to learn that the scalp is more frequently the site of lesions than the legs. In those patients who had taken arsenic no less than 40 per cent. exhibited either reactions of intolerance or late unfortunate sequelae. In view of the benefit to be derived from the use of arsenic they consider this is a high incidence of untoward effects. Perhaps the most interesting point they have brought out is that five times as many patients were overweight than were below average weight for their age and height. Many know Kaposi's old dictum that psoriasis is a disease of the healthy. It now appears that it should be rather described as a disease of the well nourished, and this observation also lends colour to the suggestion that in some obscure way the disease may be associated with a disturbance of fat or lipoid metabolism. Of the many remedies used in the treatment of psoriasis injection of colloidal manganese was favoured by Moore[3] in 1922, but his results were not obtained by Gushue-Taylor.[4] Oliver and Crawford,[5] however, now support Moore's observations and claim that in 20 per cent. of their patients good results followed injection of colloidal manganese when combined with local measures.

PATHOGENESIS OF OEDEMA

The term "oedema," originally applied to any swelling or tumour, has become nowadays restricted to an infiltration of the connective tissues with serous fluid, hydropsy of the connective tissues, with the exception of pulmonary oedema in which there is transudation of serous fluid into the alveoli of the lungs. The appearance of oedema is often preceded by a dramatic and sudden increase of the patient's weight of eight to twelve pounds. A test has been devised to determine the tendency of the tissues to oedema, by injecting into the dermis one-fifth of a cubic centimetre of 4 per cent. salt solution. Ordinarily the small white elevation produced disappears in one to one and a half hours. In patients dehydrated by vomiting, diarrhoea, or haemorrhage the time is much reduced (ten to twenty minutes). Professor Pierre Mauriac of Bordeaux, who has made extensive studies of the literature and of his patients, from the mass of information thus obtained has been led to jot down some of the important points, hoping to guide others through the tangles and obscurities of the subject. He has succeeded in producing a useful little work[1] on the pathogenesis of oedema. Even in cardiac oedema the transudation of fluids from the capillaries and small arterioles to the tissues is not the result of increased hydrostatic pressure alone; there is always some associated affection of the liver and kidneys which tends to modify the proportion of proteins in the circulating blood and thus to affect the osmotic pressure attracting the fluid back into the vessels. In renal disease the increased permeability of the glomeruli of the kidney due to toxins leads to loss of albumin from the blood and so affects the osmotic pressure more considerably, but quite an amount of kidney substance may be damaged before symptoms of renal disease occur. In renal disease another and more important factor is the retention of chlorides in the tissues, which thus tend to hold more water. Since the time of Ranvier the effect of the nervous system on the transudation from the capillaries has been recognized, depending on the sympathetic nervous system and occurring in general states of the nervous system, hemiplegia, hysteria, and in local conditions, as in angio-neurotic oedema and urticaria. Mauriac postulates the intervention of endocrine influences in some cases of oedema, not only in the oedema of cirrhosis of the liver but from ovarian factors in the oedemas of pregnancy and menstrual oedema. An oedema of cachexia may occur in starvation, in athreptic infants, and in cancer; oedema may follow operation and the explanation may be obscure. Without coming to a decision on many points which in our present state of knowledge must be left for further work. Professor Mauriac has drawn attention to many interesting problems on the metabolism of water in the body.

PROPHYLAXIS OF TYPHUS

The prevention of typhus fever and vaccination against the disease form the subject of an important communication[2] to the Health Section of the League of Nations, the introduction to which has been drawn up by Dr. Biraud, a member of the Section. Dr. Biraud relates that following an alarm concerning the presence of typhus among the troops in Madrid, the Spanish Government asked the League for technical advice, with the result that a mission of experts was sent to Spain, among them Surgeon-General Lasnet, formerly Director of the Health Services of Algeria, Dr. J. Laigret of the Pasteur Institute of Tunis and author of a method of vaccination against typhus, and Dr. C. Wroczynski, formerly Director-General of Public Health in Poland. The mission found that there was no typhus in Spain, but that its occurrence was a definite menace because of the louse infestation of the troops, the large number of refugees, and the possibilities of the virus being introduced from infected

[3] *British Medical Journal*, 1922, **2**, 41.
[4] Ibid., 1923, **1**, 558.
[5] *Arch. Derm. Syph.*, Chicago, 1937, **35**, 1120.

[1] *La Pathogénie des Oedèmes. Confrontation des Théories à la Clinique.* By Pierre Mauriac. Paris: Masson et Cie. (16 fr.)
[2] *Bull. Hlth. Org. L. o. N.*, 1937, **6**, 56.

countries. Before giving advice to the Spanish Government the mission decided to convene a larger body of experts at Geneva, including all those who had introduced methods of typhus vaccination—namely, Professor Weigl, Director of the University Biological Institute at Lwow; Hans Zinsser, Professor of Bacteriology at the Harvard Medical School; and Professor L. Anigstein of the State Health Institute, Warsaw. The meetings, which were held on February 8 to 10, were presided over by Professors E. Sergent and Ciuca, who had had considerable experience of typhus in Algeria and Rumania respectively, and Dr. M. T. Morgan of the Ministry of Health. The resolutions adopted were as follows: In the case of a threatened epidemic the following measures should be taken: (1) organization and operation of a systematic and periodical delousing service among the troops and civilian population; (2) organization of a service for the early detection of typhus cases; (3) preparation of a plan for isolation and hospital treatment of the patients; (4) preparation of a plan for isolation of infected localities; (5) formation of stocks of serum of immunized animals; and (6) vaccination with a killed vaccine of all the medical, sanitary, and auxiliary staff. When an epidemic occurred the following steps should be taken: (1) the measures for delousing and detection should be intensified; (2) measures for the isolation of patients and of typhus foci should be applied; (3) the serum of convalescents should be collected and used for protection of the staff and other contacts, except persons immunized with killed vaccine for more than one month and less than twelve months previously; and (4) mass vaccination of the military and civilian population of infected localities should be carried out.

AUSTRALIAN CANCER CAMPAIGN

The report has now been issued of the eighth Australia Cancer Conference, which was held at Canberra from April 13 to 16, under the chairmanship of Dr. J. H. L. Cumpston, Director-General of Health for the Commonwealth. In addition to an account of the proceedings and of the resolutions passed, there is included in it a review by Dr. C. E. Eddy of recent developments in radiological physics, a review of the activities of the Commonwealth *x*-ray and radium laboratory of the University of Melbourne during 1936, and an account of the developments in that year in connexion with cancer control in Australia. It was urged by the Conference that the Commonwealth Government should become a member of the International Union against Cancer; that State organizations formed for the control of cancer should become affiliated with the British Empire Cancer Campaign, and that more active steps should be taken in regard to educational and publicity work throughout the Commonwealth. Most of the clinical papers read at the Conference are being published in the *Medical Journal of Australia*; a paper by Dr. J. S. MacMahon on epithelioma of the lip will appear in the *Australian and New Zealand Journal of Surgery*. The Conference supported the recommendation of the National Health and Medical Research Council that an annual sum of £30,000 should be made available to establish a permanent and reliable system of medical research. A committee will report to the next conference on the better organization of cancer investigation in Australia, particularly on developments in biochemical research in relation to cancer problems and of biochemical science in relation to treatment.

ERADICATION OF CONTAGIOUS ABORTION IN NORWAY

Norway was one of the first countries to undertake a serious campaign against tuberculosis in cattle. As far back as 1895 the tuberculin test was introduced for the detection of infected animals. By a programme directed towards the eradication of the disease, which includes regulations forbidding the importation of reacting animals and the sale of reacting animals except for slaughter, it has proved possible to reduce the extent of tuberculous infection to the extremely low level of 0.18 per cent. Undoubtedly the anti-tuberculosis campaign has been helped by the small size of the average herd and the absence of overcrowding, but even so the achievement is one to be proud of. Attention is now being given to the control of contagious abortion. This disease, though less important than tuberculosis from the standpoint of human hygiene, is nevertheless of greater economic importance to the farmer by reason of the loss of calves, the frequent sterility of the infected animals, and the diminution in quantity of the milk supply that are so often associated with it. By a law dated June 29, 1934, regulations were introduced with the twofold object of preventing the spread of infection from one herd to another and the elimination of infection from herds already infected. The State provides free blood testing and affords compensation for the slaughter of reacting animals. Special control is exercised over the movement of infected animals, over the sale of pregnant animals, and over common grazing grounds. The scheme is partly voluntary, but is apparently meeting with widespread acceptance. According to the Chief Veterinary Officer, Mr. N. Thorshaug,[1] 119,587 samples of blood were examined at the expense of the State in 1935, in addition to 14,000 special samples taken from animals destined for sale. Altogether 10,500 animals were found to react positively, of which 8,655 were slaughtered with indemnity from the State. Records were at hand in 1935 of 2,278 infected herds. No fewer than 636 of these had been successfully freed from the disease by October, 1936, 787 no longer contained any reacting animals but were still waiting for their final agglutination test before being declared free, 647 had not more than two reactors, while only 208 had more than two reactors. There is reason to believe that in a short time contagious abortion will be practically eradicated from the majority of the herds in Norway. We in this country may well look with envy on this success. The difficulties with which we are faced are very considerable, but it is to be hoped that a serious attempt will now be made by the Government to deal with animal disease in a more

[1] *Bull. Off. int. Hyg. publ.*, 1937, 29, 956.

radical fashion than has hitherto been attempted. So long as the importation of infected animals and the mixing of animals in open markets are permitted, and so long as financial assistance to encourage the farmer to rid his herd not only of diseased but also of infected animals is lacking, so long will any attempt to control tuberculosis in animals and contagious abortion be merely touching the fringe of the problem.

SURGICAL APPROACH TO ENDOCRINE INSUFFICIENCY

Most investigators, in considering the syndrome of an endocrine hypofunction, will in general associate it with a loss of power of the gland to synthesize the necessary hormone and refer this to some more or less defined structural defect. But the demonstration of structural changes at necropsy is by no means a proof that the onset of the disease was due to such changes. Although some cases may be the result of an original insufficiency of the secreting epithelium, it seems probable, as pointed out by R. Leriche,[1] that a more fruitful hypothesis is that the glandular elements do not receive in quantity or in quality the substrata necessary for their activity. The problem of glandular insufficiency on such a view becomes one of vascular supply or of the composition of the supplied blood. Such a hypothesis also opens the way for surgical attempts at reactivation. Leriche, in the absence of full knowledge of all the factors concerned in endocrine activity, lays down two objects of surgical approach: (1) to discover if the circulatory activity of a gland can be increased by surgical intervention, and to observe if such an increase, when produced, remains permanent; and (2) to attempt to influence the activity of an endocrine gland by modifications of the secretory or excretory activity of a gland in another situation. He and his collaborators applied these ideas mainly in work upon the parathyroids. It was found that removal of the upper part of the cervical sympathetic chain in the dog led to marked histological changes in the parathyroids. In twenty-four hours after the operation there appeared a marked oedema between the sinusoidal capillaries and the parenchymatous cells, followed by congestion and increased volume of the secreting cells; it was found that this state continued even after ten months. Concluding from such findings that a state of increased activity in the glands had been established, Leriche and his co-workers tried to produce clinically demonstrable effects by cervical sympathectomy in a child of 11 years who had severe tetany and pylorospasm, and in whom the administration of calcium and parathormone had been of no avail. Resection of the middle region of the cervical chain was carried out and the attacks of tetany disappeared, so that two and a half years after the operation the child is developing normally and has had no further attacks. The level of blood calcium is now over 10 mg. per 100 c.cm. and hypocalcaemia has ceased to appear. Two further cases of tetany similarly treated also did well. The application of this method of re-activation of the parathyroids was extended to cases of polyarthritis, and results were obtained which strengthened the view held by Leriche that frequently these cases are really due to hypoparathyroidism. On this hypothesis the benefits sometimes recorded as having resulted from removal of one of the parathyroids are attributable not to diminution of the amount of active parathyroid tissue but to the local hyperaemia produced by operation, since as often as not the tissue removed is not parathyroid but fat. Leriche and his collaborators also claim to have benefited some cases of Paget's disease by ablation of the middle cervical ganglion. The possible application of sympathectomy to cases of otosclerosis is also indicated by the good results obtained in fourteen cases at the Strasbourg clinic, but it is considered that the effect was on the parathyroids rather than on the circulation in the ear. How far similar measures would be useful in other glandular insufficiencies remains to be seen, but as the pituitary innervation is from the cervical sympathetic such procedures as removal of the superior cervical ganglion might perhaps be of value in those cases of pituitary insufficiency which are resistant to pituitrin or in cases of hypofunction of endocrines regulated by the pituitary. The whole subject, as emphasized by Leriche, is in its infancy, but it will well repay investigation, since it offers an attack on endocrine disorder in a way more fundamental than replacement therapy.

[1] *Rev. Chir.*, Paris, 1937, **56**, 75.

DEFORMITY OF THE DENTAL ARCHES

We have received from the Medical Research Council a report on investigations into the nature and characteristic features of post-normal occlusion.[1] The work involved statistical consideration of a large number of measurements of selected samples of living children of different ages which the investigators hoped would settle the vexed question of superior protrusion or inferior retrusion as the important factor in the production of deformity of the dental arches. In concluding their report the investigators say that " the main result of the investigations is to provide very suggestive if not conclusive evidence that the origin of inferior post-normal occlusion in the great majority of boys but in a smaller proportion of the girls examined is essentially dependent on the degree of forward growth or the position of the upper jaw and not on retrusion of the mandible." The main point, indeed, remains unsettled, but a well-conducted attempt has been made to approach it from a statistical standpoint.

The late Lord Rutherford, O.M., was one of the surviving two Honorary Fellows of the Royal College of Physicians of London. He received that distinction in 1928 at the time of the Harvey tercentenary, in company with Lord Balfour, Professor Pavlov, and Professor Wenckebach.

[1] Special Report Series No. 225 M.R.C. Investigations into the Nature and Characteristic Features of Post-Normal Occlusion. By Matthew Young, Elsa Johnson, Corisande Smyth, and Mildred Still. H.M. Stationery Office, 1937. (1s. 6d. net.)

ANAESTHESIA IN GENERAL PRACTICE

This is one of a series of articles, contributed by invitation

RISKS OF ANAESTHESIA—II

BY

M. D. NOSWORTHY, M.D., B.Ch., D.A.

Respiratory Obstruction

The maintenance of a free and adequate respiratory exchange is of the first importance. Respiratory obstruction occurs when the patient's respiratory efforts do not run parallel with the gaseous interchange. An obstructed airway dams back carbon dioxide in the lungs, hampers the entry of oxygen, exhausts the patient through his muscular efforts to get air in, embarrasses the circulation, and may precipitate a vascular accident. When examining the patient beforehand the anaesthetist can often foresee whether he may have obstructive or other difficulties. Questioning the patient about his normal activities—does he get out of breath after climbing stairs, etc.?—is a better guide to his physical fitness than any formula. The presence of anaemia or dehydration should also be looked for; it is obviously of advantage to know in advance whether fluids are likely to be required during the operation. The full-blooded, short-necked type of individual is prone to become congested and obstructed during induction. The condition of the teeth and the patency of the nostrils are worthy of examination. Both the pharynx and the larynx of the heavy smoker are very irritable, and it is useful to remember that when morphine and basal hypnotics depress the sensitivity of the respiratory centre they do not decrease the sensitivity of the larynx to the same extent. This combination of circumstances does not facilitate induction with irritant anaesthetic agents.

It is most important to be certain that the stomach is empty before induction, and it must be borne in mind that fear markedly prolongs its emptying time. At a depth of anaesthesia sufficiently light for the occurrence of active vomiting, the laryngeal reflex is intact, so that the glottis will close. The patient, however, can only hold his breath until the alveolar content of carbon dioxide has risen to a level which, as it were, breaks through this reflex, and, if aspiration is to be avoided, it is imperative that the head should be lowered and any vomit in the pharynx removed before this breath is taken. Gastric and obstetrical emergency cases should have a preliminary wash-out if there is any likelihood of the stomach not being empty. The manipulations of the obstetrician during an external version may well express gastric contents, and at the depth of anaesthesia necessary for this manœuvre the laryngeal reflex will have been abolished. Should vomiting occur there must be no delay in tipping the patient head downwards and removing the vomit, preferably with suction. The anaesthetist must also remember the possibility of reversed peristalsis. A patient suffering from intestinal obstruction must be expected to regurgitate copious quantities of intestinal contents at any moment.

SPECIAL CONSIDERATIONS

Before embarking on an operation on the nose, mouth, or throat the anaesthetist must decide which of the various methods he is going to adopt to safeguard the patient from the aspiration of blood or pus. Apparatus must be tested before being used to see that there is no possibility of blowing liquid ether into the patient's lungs. During and after operation the anaesthetist must bear in mind the possibility of a foreign body, such as a forgotten swab, obstructing the air passages; a suitable posture must also be maintained during recovery. Some oedema of the glottis may be expected as a result of inflammatory processes in the pharynx or neck. This will become much worse if any asphyxia accompanies induction. Tracheotomy may be advisable before the induction of anaesthesia, and this is the last resort for any complete obstruction situated in or above the glottis. It is inadvisable to give any general anaesthetic before opening a quinsy. It is to be expected that a patient with carcinoma of the oesophagus will regurgitate a quantity of mucus.

Thyroid patients with obstruction should be given little premedication unless the anaesthetist is on the spot, as their obstruction often becomes worse when they go to sleep. When the obstruction is very severe intubation under local anaesthesia is a wise precaution. Bilateral abductor paralysis of the cords or tracheal collapse will necessitate immediate intubation. The presence of emphysema or of secretion in the tracheo-bronchial tree interferes with free gaseous interchange; it takes longer to get oxygen and anaesthetic agents into these patients, and, what is equally important, it takes longer than usual to get carbon dioxide and the anaesthetic out again.

The consequences of opening the pleural cavity require the anaesthetist's attention; if both cavities are opened artificial respiration with positive pressure is essential. The changing of the position of a patient too lightly anaesthetized, or the presenting of too concentrated an anaesthetic vapour may also upset the respiratory rhythm. The angle of his head in relation to his neck and the position in which he lies during operation may interfere with normal respiratory exchange. Other points which may not be appreciated are that the use of either the kidney rest or the gall-bladder bridge is conducive to pulmonary collapse, and that the prone position and the weight of the abdominal contents on the diaphragm in the full Trendelenburg position hamper respiration.

CONGESTED ASPHYXIAL OBSTRUCTION

This may occur during induction. A rubber naso-pharyngeal tube is useful if attempts to push the jaw forward fail. The tube must not be too large, and it must be passed before the congestion becomes marked, otherwise bleeding will follow and make matters far worse. The insertion of the usual pharyngeal airway when the spasm is fully developed is well-nigh impossible. As his alveolar content of carbon dioxide rises the patient's efforts to get air in are usually successful. Oxygen is what he needs, and an attempt must be made to force this in; for unless the asphyxia is relieved the muscular spasm will not relax until shortly before death. When this relaxation occurs there is nearly always time—*though it must not be counted upon*—to insert an airway quickly and inflate the lungs with oxygen.

ATONIC OBSTRUCTION

For this type of respiratory obstruction, which develops when the muscles of the jaw, tongue, and pharynx have lost their tone, a pharyngeal airway is indicated. Waters' pattern is superior to any other, and if the base of the

tongue is pressed forward with the left forefinger so that the airway drops into place it is non-traumatic, in spite of being made of metal. This airway can be inserted

Waters' Pharyngeal Airway.

even when the jaws are in spasm (see above) if the left forefinger is used as a wedge behind the last molar tooth.

LARYNGEAL SPASM AND STRIDOR

These are two degrees of the same reflex. The appearance of either during induction shows that the anaesthetic vapour is too strong, or that particles of mucus are directly irritating the vocal cords. Surgical stimulation, especially of the peritoneum or perineal region, will set up these reflexes if the depth of anaesthesia is insufficient to dull them. A low-pitched stridor usually passes off as anaesthesia is deepened. With a high-pitched stridor, however, the cords practically close during inspiration and the respiratory exchange is seriously reduced. If, when all surgical intervention is stopped, the cords relax the anaesthetist may be able to regain control. As a rule, however, the reflex—once thoroughly irritated—is likely to recur at the slightest provocation, even though anaesthesia is subsequently maintained at a much deeper level than would have been necessary had it been adequate in the first instance.

Intubation as a cure for laryngeal stridor is a confession of failure, but it is better to do this than to allow the respiratory obstruction to remain throughout the operation. A tube a little stiffer and smaller than usual should be employed, and it should be introduced—in contrast to the normal practice—during expiration. Intubation at too light a depth of anaesthesia may make matters worse for a time, as the patient may hold his breath and keep his chest rigid and immobile long enough for his circulation to become embarrassed. While on the subject of intubation, I must add that the anaesthetist will save himself needless worry if he makes certain before the operation starts that the tube and connexions cannot come adrift, and that there is no chance of the patient biting through the tube. The lumen of a soft tube can easily be obliterated by kinking or by pressure from a throat pack. Finally, care must be taken not to introduce the tube so far that its end stretches beyond the bifurcation of the trachea into one bronchus.

Primary Cardiac Failure

Although I have never seen the condition, many cases have been reported in which the combination of light anaesthesia and excess of adrenaline in the blood stream as a result of fear, excitement, or the introduction of the drug itself, together with the stimulation of operative intervention, has resulted in ventricular fibrillation. In my opinion the commonest cause of cardiac arrest under chloroform anaesthesia is a relative overdose following the sudden inspiration of a large quantity of the anaesthetic. For example, this might occur during the deep breaths following a period of apnoea or shallow breathing, the deep breaths of the second stage of anaesthesia (especially if the heart is already embarrassed by some degree of asphyxia), and those following a cough, or, if anaesthesia is incomplete, the first incision. In such an emergency a child may be held up by his feet, or in the case of an adult the table may be tilted into the full Trendelenburg position at once. Artificial respiration must be started by rhythmical squeezing of a bag filled with oxygen. Local stimulation, in the form of hot cloths, may be applied to the praecordium. If the patient's condition does not improve in a minute or two cardiac puncture through the third right intercostal space, followed by cardiac massage, must be resorted to, artificial respiration being carried on the whole time.

Circulatory Depression

Collapse from cerebral anaemia may be brought about by a sudden change from the Trendelenburg to the horizontal position, or by allowing a patient who is deeply anaesthetized, or under the influence of a spinal anaesthetic, to be propped up. Many factors embarrass the circulation and contribute to its exhaustion during operation. The adoption of unnatural postures; the introduction of abdominal packs; the presence of respiratory obstruction; the inadequacy of the anaesthesia for the operative procedure in hand; the loss of muscle tone, the abolition of normal chest movements, and the toxic effects of the anaesthetic agent in prolonged deep anaesthesia; surgical trauma to muscle and nervous tissue; and loss of body temperature and fluids may all play a part in the production of shock. It is a good practice to introduce rectal or subcutaneous salines throughout long operations which are known to be associated with shock. A pause for recovery in the middle of a severe operation will often enable a patient to rally and then withstand a fresh onslaught. The patient usually "compensates" for a time when haemorrhage occurs, and circulatory failure sets in later if this compensation is overtaxed. All degrees of circulatory depression are met with. The onset of true shock is insidious, and the classical signs are well known. If repeated observations of the blood pressure and pulse rate are made treatment can be started before this advanced state is reached, and results will be much more satisfactory.

The table should be slightly tilted head downwards, the patency of the airway should be verified, and an adequate respiratory exchange kept up with an atmosphere rich in oxygen. The lightest possible level of anaesthesia should be maintained—if an inadequate depth of anaesthesia was primarily responsible, it is too late to do any good by increasing the depth after the appearance of true shock. A 5 per cent. solution of glucose should be given intravenously in sufficient quantity to bring the systolic blood pressure up to 90 per cent. of the patient's normal figure. A blood transfusion may be advisable. After operation the patient must be kept warm but not over-heated. Oxygen should be delivered at a rate of six to eight litres a minute through a nasal catheter, the perforated tip of which should protrude as deeply into the oropharynx as possible without giving rise to swallowing movements; this is especially indicated if there is any restlessness. Although morphine, by lowering metabolism, reduces the patient's requirements of oxygen, it also reduces his oxygen intake by decreasing his respiratory exchange at the same time. Unless the patient's need is urgent fluid is best introduced by mouth or rectum, because, among other reasons, he can then reject any excess.

Convulsions

"Jactitations" under nitrous oxide are asphyxial in origin and call for the introduction of air or oxygen. So-called "ether" convulsions usually occur when the temperature is high in patients with some infection

—for example, a sick child with acute appendicitis. They begin with twitchings in the muscles of the face, and may soon spread and become generalized. The breathing has usually been depressed or somewhat obstructed, and it is thought that the raised alveolar content of carbon dioxide is the factor which determines the onset of the convulsions in most cases. In support of this hypothesis it may be mentioned that convulsions have begun upon the addition of carbon dioxide to facilitate blind intubation, stopping when the gas was turned off, and not returning although ether was used throughout the operation. Whatever the stage of the operation the anaesthetic must be discontinued until the convulsions are controlled. The respiratory exchange must be increased by rhythmical squeezing of a bag filled with oxygen, though this may be difficult to carry out on account of the respiratory obstruction. If no improvement follows lowering the alveolar content of carbon dioxide, sufficient evipan or pentothal should be injected intravenously to control the convulsions, the artificial respiration being meanwhile continued.

Convulsions—and circulatory collapse—are the most serious manifestations of poisoning by cocaine or allied drugs. Other symptoms and signs of toxicity have as a rule been missed or unheeded. These convulsions will be stopped by the intravenous injection of a barbiturate, but, as these patients all die of oxygen want, it is the anaesthetist's duty to start artificial respiration without delay, and to maintain an efficient respiratory exchange while the barbiturate solution is being prepared and injected.

Other Risks

Damage to the Eyes.—Precautions must be taken to avoid any anaesthetic agent getting into the eyes. The face-piece or gamgee tissue and the anaesthetist's fingers must not rub them. The eyes should be kept closed throughout the operation. If they tend to open they must be repeatedly moistened by the moving up and down of the upper lids. If the reflexes have not returned by the end of the operation and the eyes tend to remain partly open, a drop of castor oil should be instilled into each eye, and the patient should be so arranged in bed that he cannot rub his eyes on the pillow during recovery.

Explosions.—Sources of explosion are: the cautery, naked flames and fires, diathermy machines and electric motors, faulty electrical connexions, and static electricity. In the concentrations used during anaesthesia the only agents which are non-explosive are basal hypnotics, local anaesthetics, nitrous-oxide-oxygen, carbon dioxide, and chloroform. The quarter from which any draught in the theatre is coming and the relative weights of the anaesthetic and air will determine in which direction the vapour will travel. Appreciation of these points may, in certain circumstances, permit the use of the diathermy needle in the presence of explosive mixtures. Static electricity is fortunately an uncommon factor in this country, a possible explanation for this being the high relative humidity of the atmosphere. A wise precaution is to damp the inside of the bag, rubber tubing, and face-piece with water before induction, thereby reducing friction and the risk of electric sparks. Soon after the anaesthetic is begun complete saturation of the atmosphere takes place in a closed system with carbon dioxide absorption, making the risk of explosion from this cause, for practical purposes, negligible. In the absence of leakage from such a closed system in which the anaesthetic mixture is 'explosive' the diathermy needle may be used with safety except in the vicinity of the lungs or air passages.

MEDICAL USES OF RADIUM

REPORT BY MEDICAL RESEARCH COUNCIL

The report of the Medical Research Council on the medical uses of radium during the year 1936[1] illustrates very strikingly the increased use of radiotherapeutic measures in the treatment of malignant disease. When the annual figures contributed by the various centres during the years 1930–6 are added together a total of 18,496 cases of malignant disease is reached, of which 5,452 (29.5 per cent.) were treated by surgery alone, and 7,355 (39.8 per cent.) by radium alone.

The numbers of cases treated by different methods during the year 1936 are shown in the accompanying table.

TABLE I.—*Relative Frequency of Surgical and Radiotherapeutic Treatments in 1936*

	Number Treated in 1936	Percentage
By all methods	4,419	100.0
„ surgery alone	1,365	30.6
„ radium alone*	1,426	32.3
„ *x* rays alone	858	19.5
„ surgery + radium	224	5.1
„ „ + *x* rays	285	6.5
„ radium + *x* rays	215	4.8
„ surgery + radium + *x* rays	46	1.0

* Treatment by "radium alone" may involve surgery of access.

Cancer of the Breast

The Birmingham General Hospital presents a very full account of the work done in this condition during the past year. There has been a slight diminution in the number of cases treated by radium, which is attributable to the more extended use of high-voltage *x*-ray therapy in operable and border-line cases, and subsequent amputation, whenever this is practicable. When treatment by radium has been carried out the exact position of the needles with respect to each other, to the tumour, and to the skin has received careful attention: and, in addition to clinical measurements made at the time of insertion, valuable assistance has been afforded by combined radioscopy, radiography, and stereoscopy. The value of the last-named method is greatly increased with practice: but it is pointed out that these methods still leave a good deal to be desired, and some improved technique would be of great value, though it would have to be simple in application and at the same time suitable to the large numbers of needles used for treating carcinoma of the breast.

In treating axillary lymph glands it is found that, especially in stout patients, many receive an inadequate dose owing to the difficulty of securing even distribution of dosage. Attempts have therefore been made to use barrages from three or more planes of needles without placing any in the axilla itself. Stainless steel wire has entirely replaced silkworm gut for securing the needles, and the filtration has been increased to 0.9 mm. platinum by the use of additional sheaths. At Birmingham, as elsewhere, surgery is advocated in all early cases, and the radiotherapist treats only such as are unsuitable for surgery owing to some accompanying general condition such as advanced age, diabetes, pulmonary or cardiac disease of long standing, and refusal of the patient to submit to operation. At the Marie Curie Hospital cases at the time unsuitable for operation have been treated during the past year by the low-intensity method of *x*-ray therapy.

St. Bartholomew's Hospital reports on the results of a routine histological examination of the breast and axillary

[1] *Medical Uses of Radium.* Summary of Reports from Research Centres for 1936. Medical Research Council. Special Report Series, No. 226. H.M. Stationery Office. (1s.)

glands after irradiation for carcinoma. The series of fifty cases has now been completed, and the results are summarized in the following table:

TABLE II.—*Number of Cases Showing Cancer Cells 70 Days After Irradiation in the Breast and Axillary Glands (50 Cases)*

Total number of cases investigated	50
Carcinoma cells found in breast	34
„ „ not found in breast	16
Axillary glands palpable before irradiation:	
Carcinoma cells found	15
„ „ not found	16
Axillary glands not palpable before irradiation:	
Carcinoma cells found	10
„ „ not found	9

"Of the fifty specimens which have been studied histologically seventy days after irradiation, thirty-four contain carcinoma cells, but it must be pointed out that in at least half of the positive cases the cells show signs of gross degeneration, and in many they look as though they were about to disintegrate and become absorbed. In order to clear up this doubtful point it was decided to carry out a further series of investigations in which the tumour will be left for a period of six months before it is excised for histological examination. Nine cases have been irradiated and one excised in this new series. In addition to the radium series, cases of advanced carcinoma treated by deep *x* rays are being similarly examined. So far eleven cases have been recorded in this manner."

Cancer of the Cervix Uteri

The Birmingham General Hospital decided in 1936, after a trial of both methods, to adopt the Stockholm in preference to the Paris technique. In principle the former is by three applications of 110 to 160 mg. of radium element of fourteen to eighteen hours each; the latter by continuous irradiation by 67 mg. for five days. It was found that the Stockholm method was better tolerated by the patients, and was easier to manage from the nursing point of view. It is hoped at a later period to give a comparative analysis of the results obtained by both methods.

Since 1935 it has been the practice to give a full course of high-voltage *x* rays, beginning one month after the last Stockholm treatment. From the diagnostic point of view parametric invasion is best detected by rectal examination, which has also been found valuable in assessing the limits of a cervical tumour. Biopsy and bacterial examination are carried out in every case; in the former it is important that the operation should be one of avulsion rather than cutting, and it is essential that a portion of the endocervical region should be included in any section of suspected carcinoma of the cervix.

Lacassagne's view that the general health of a patient when first seen only rarely furnishes a contraindication to radiotherapy is borne out by the experience of the Birmingham school, as is also the view that the blood count—except for changes due to bacterial infection—is not a safe guide either to prognosis or treatment. In support of this the details of an interesting case are given, which is so instructive that we quote it in full.

The patient, aged 52, was first seen in March, 1932, complaining of intermittent bleeding for a year, very profuse for six weeks immediately before; recently the bleeding had been accompanied by considerable foul discharge. The cervix was replaced by a high cavity with irregular friable walls, extending as high as the internal os. All fornices were obliterated, but the cavity seemed to burrow rather more towards the right than the left. The body was small and was anteverted, and the walls were covered with fragments of necrotic material which had undergone mucous degeneration. The general condition was very poor. The blood count was: red cells, 1,090,000; white cells, 16,000; haemoglobin, 13 per cent.

A blood transfusion was given on March 21, 1932, and on March 31 radium was introduced in accordance with the Paris technique—that is, 8,000 mg. hours spread over five days. The pathologist's report was: "Adenomatous tissues with irregular epithelial proliferation and many abnormal mitoses. The appearances are those of a malignant adenoma showing mucoid degeneration." By April 13 the blood count had risen to: red cells, 2,940,000; white cells, 2,800; haemoglobin, 36 per cent.

The cavity in the cervix was much cleaner and all bleeding had stopped. The general health improved; but by November 23, 1932, there was a large ulcer, with necrotic floor, on the cervix and involving the anterior vaginal wall. A further dose, identical with the first, was given, and after this progress was uninterrupted. She was seen a week before the date of writing this report, and is in perfect good health, with no sign of recurrence.

As it had been found at the Marie Curie Hospital[2] that after treatment of carcinoma of the cervix by radium later recurrences were usually situated high up in the pelvis, it was decided that external irradiation, by *x* rays or teleradium, was desirable either as a preliminary or a sequel to the intracavitary application of radium. It is, however, only recently that facilities have been available for carrying this out. The technique now adopted is to give preliminary *x*-ray therapy up to one-half or two-thirds of the dose which would be given if *x* rays alone were used. The dosage given was approximately 2,000 *r* to 2,500 *r* at 10 cm. depth. If the patient's condition is satisfactory this is followed by intracavitary radium, the dose under these conditions being from one-half to two-thirds of that normally applicable to the individual case.

Although not enough time has elapsed to allow of a final opinion being given, the impression received has been that even these moderate preliminary doses of radiation produce more fibrotic contraction than is found when radium is given first, and that the contraction of the vaginal vault interferes with the efficient distribution of the radium. Beyond this difficulty, the immediate results, as regards both the general condition and the state of the neoplasm itself, appear to be satisfactory.

In all cases the *x*-ray therapy has been conducted by Coutard's low-intensity method. In biopsy material taken after irradiation there was considerable diversity of effects. Definite effects on cancer cells were observed in material removed during the second week of the low-intensity *x*-radiation. In later stages the predominant picture was one of advanced fibrosis with small islands of irradiated, but still probably viable, cells. In a few cases there was only fibrotic tissue with occasional and doubtfully viable degenerated cancer cells. The radiation was always arranged so as to give a calculated and even distribution throughout the pelvis. External radiation appeared much less effective in cancer of the endocervix and corpus uteri, and curettage specimens removed after a dosage as high as could be tolerated showed actively growing carcinoma cells. Cancer in these situations requires the local high intensity of dosage given only by intracavitary radium.

Histological examinations of material removed at intervals during the course of radiation treatment has been a special feature of research at the Marie Curie Hospital. Although the specimens taken are small, the information obtained from them provides an index of the effects of radiation on the tumour cells, and may serve as a guide to further treatment as regards both dosage and distribution. For instance, histological examination of tissue removed from the cervix or vagina has sometimes demonstrated that the primary site was the corpus, although there was no clinical evidence that this was the case.

Cancer of the Mouth, Nasopharynx, Larynx, and Oesophagus

The Birmingham General Hospital contributes a valuable and interesting report on these conditions. With regard to the mouth, it was found that the best results were obtained when the buccal aspect of the cheek, the lip, and the palate were the site of growth; the floor of

[2] Medical Research Council's report for 1930.

the mouth and the alveolus gave the worst, as the growth spreads rapidly into the cellular tissues of the floor of the mouth and also invades the bone. In addition to this, epitheliomata in these situations are less radiosensitive than in the more favourable sites. If the bony tissues are invaded it is impossible to destroy the neoplastic cells without producing necrosis of the bone itself; it is therefore necessary after preliminary irradiation of the growth in the soft tissues to await the subsidence of all reaction and then to treat any affected bone by surgical excision.

Intrinsic carcinoma of the larynx treated by the thyroid fenestration method has given good results, and usually the normal speaking voice has been regained. With extrinsic laryngeal growths and those beginning in the hypopharynx the case is very different, and surgical treatment, although admittedly involving serious and extensive mutilation, still offers more chance of success than radiotherapy. Carcinoma of the oesophagus still remains an "almost insuperable" problem. Diagnosis is almost invariably late and radiation treatment only palliative.

Teleradium Therapy

Teleradium therapy—or the external application of the radiation from a large quantity of radium—is still in its experimental stage. The 1-gramme unit at the Middlesex Hospital has been in constant use since 1932, and is soon to be replaced by a 4-gramme unit. It has mainly been employed in the treatment of neoplasms in the mouth, pharynx, and larynx, not because its use is regarded as unsuitable in other sites, but because it was required for the whole time in the treatment of these particular conditions. Since the installation of the 1-gramme unit it has been the first method of treatment adopted for the conditions mentioned, and in some cases no further treatment has been necessary. It was, however, often found that additional treatment was essential. This, of course, varied according to the condition of the patient: implantation of radium needles in residual growths of the tonsil and tongue, surface application of radium needles mounted on dental applicators in carcinoma of the floor of the mouth, and block dissections of the glands of the neck were all used as circumstances dictated.

A detailed account of teleradium application may be of interest.

"Two sessions of two hours each in twenty-four hours are given, with at least a six-hour interval between. In certain cases—for example, orbital tumours—two areas are sufficient to cover the involved region. In the mouth, pharynx, and larynx up to ten areas are used in order to cover adequately the whole field of suspected involvement, both primary and secondary, with a margin of healthy tissue. These areas are drawn on the patient with an aniline pencil, guided by a circular ruler of the same diameter as the aperture of the unit, and a corresponding chart is kept. When both sides of the face or neck are being irradiated, alternate sides are treated in rotation in order to obtain uniform saturation. The margins of adjacent areas are allowed to touch, and no ill effect from overlapping has been observed. If only two areas are used a total of twenty-four hours' treatment on each area can be given; but with multiple areas a total of twenty hours is the maximum the healthy tissues can stand. Treatment is given daily, and is continuous for ten to thirty days without an interval, depending on the number of areas. When only two areas are used treatment is given only once daily, in order to prolong the total duration."

Experience has proved that the slightest inaccuracy in application may make all the difference between success and failure, and it is necessary for each treatment to be supervised by a specially trained medical officer. In most cases the treatment is followed by a skin reaction, which normally proceeds from an erythema to a desquamative epithelitis which heals rapidly, but sometimes the skin reaction is severe, and in these cases ambrine dressings have been found useful. It has often been noticed that when the skin shows only a slight erythema a mucosal lesion is covered by a fibrinous membrane

Special attention must be paid to nursin[illegible]id in mouth and throat cases the mouth should be [illegible]igated with bicarbonate solution after each meal. Abundant fluids are necessary, and the patient is made to drink at least five pints daily. During the four years in which the 1-gramme unit has been in use in only two cases has a tracheotomy been necessary in consequence of the severity of the reaction in the mucosa.

Non-malignant Conditions

At the Marie Curie Hospital 1,265 patients suffering from simple metrorrhagia have been treated by radium. Of these, 869 were menopausal cases all over 40 years of age; the remaining 396 were aged 40 years or under. It was observed that a number of patients admitted as simple cases of non-malignant haemorrhage were found on histological examination of biopsy material to have early cancer of the cervix or corpus. Myomata, usually of small size, were found in 138 of the haemorrhage cases.

An investigation of non-malignant haemorrhagic uterine cases is being carried out from a histological point of view. It is hoped that it may be possible to determine whether any correlation exists between histological type with its possible aetiological significance and the response to radium treatment.

The clinical section of the Medical Research Council's report is preceded by a brief summary of the more purely experimental work in physics and radiology. Dr. Mayneord at the Royal Cancer Hospital has completed his researches on the standardization of gamma-ray dosage, which confirm the previous estimate that "the ionization produced in one hour by a point source of radium element at one centimetre distance and filtered with 0.5 mm. of platinum is equivalent to 8.3 *r*." Problems connected with the control of cell division by radiation are discussed by Dr. Spear and Dr. Glücksmann of the Strangeways Laboratory, Cambridge, and Dr. Lea deals with the action of radiations on bacteria. Dr. Mottram at the Mount Vernon Hospital records experimental work on radiosensitivity, as do also Dr. Colwell and Dr. Gladstone at the Middlesex Hospital. At the latter hospital Professor Russ and Miss Scott report upon some biological effects of continuous gamma irradiation, while Professor Paneth, Dr. Tillman, and Dr. Moon at the Imperial College of Science and Technology have been engaged in the investigation of neutrons and some of the physico-chemical effects produced by neutron bombardment.

BRISTOL ROYAL INFIRMARY

200th ANNIVERSARY FESTIVAL

The two hundredth anniversary of Bristol Royal Infirmary was celebrated on October 21 and 22 by three outstanding events—a reception by the Lord Mayor at the city Art Gallery, attended by 900 people; a reception of a more domestic kind at the hospital itself for past and present staff and students; and a dinner at the University Union, with over 300 guests. The Church in the person of the Bishop and Dean, the City in the person of the Lord Mayor and Sheriff, the University in the person of the Vice-Chancellor and the members of the medical faculty, the local medical profession, and representatives of nursing all assembled in honour of this ancient charity. Delegates also attended from the Royal Infirmaries of Birmingham, Cardiff, Leeds, and Liverpool, the Sheffield United Hospital, and Guy's and St. Thomas's. One of the delegates from Guy's was its matron, Miss MacManus, formerly matron at Bristol.

The guests were received by Lieut.-Colonel P. G. Robinson, President of the Royal Infirmary, and Alderman

F. Sheppard, chairman of the committee. Their health was proposed by Dr. P. Watson-Williams, consulting surgeon to the ear, nose, and throat department, and Mr. Eric Watson-Williams, surgeon in charge of that department, acted as honorary secretary of the celebrations.

At the Royal Infirmary the guests had the opportunity of seeing not only recent improvements and installations, but also the historical treasures and records of the foundation. Few hospitals have been as fortunate in their chroniclers. Before the eighteenth century was out Richard Smith, a surgeon of the Infirmary, collected innumerable details about persons and things relating to its early years, and in more modern times another surgeon, Munro Smith, completed the account in a published history.

The subscription list for the new Infirmary (the word "Royal" was a much later prefix) was opened on November 22, 1736; out-patients were attended first on June 30 of the following year, and in December the building was opened for in-patients, the opening taking the form of a service at St. James's Church, attended by the mayor and corporation and the medical staff, followed by a royal dinner at the Nag's Head. It is believed that it was the first provincial hospital in which in-patients were received. Their number in the first year was 194, and that of out-patients 234, contrasting with 10,300 and 70,500 respectively last year. The first year's expenditure was £434; the annual expenditure is now £72,000. Two names specially associated with the beginning of the institution are those of John Elbridge, a controller of Customs, who erected and furnished the original building at his sole expense, and John Bonython, the first physician.

Then and Now

At the banquet in celebration of the bicentenary a very interesting speech, historically flavoured, was made by Professor A. Rendle Short, senior surgeon to the Infirmary. At the time the Infirmary was opened, he said, the condition of the sick poor in Bristol, as in other towns, was deplorable. There was indeed a hospital (St. Peter's), but it provided only for those who were very ill and also destitute; the generality of the sick poor merely had the services of apothecaries, often ignorant men, and these had to give their services almost gratuitously. Then the medical men and business men of Bristol came together and blazed a trail.

The hospital, of course, dated back to long before the days of chloroform anaesthesia. Operations were then a formidable business. They were, indeed, few and far between, and were reckoned great occasions. One entry in the hospital records ran: "Mr. Richard Smith cut for stone . . . in the presence of the Mayor and several gentlemen." Great advances like the introduction of chloroform were not welcomed with open arms. Nearly every such advance saw the resignation of one or more members of the staff who could not adjust themselves to the new scheme of things. A strange story was told, said Professor Short, of one of the first cases in which chloroform was administered at the Infirmary, when probably the anaesthetist, the surgeon, and the patient were equally terrified of the drug. It was an operation on an adult for hare-lip. The anaesthetic was given on a sponge; but there was not nearly enough of it, and the patient leapt from the table and raced round the building with the anaesthetist in pursuit. Many more years elapsed before antiseptic methods were established. In the surgeon's record book for 1875 was a dreary catalogue of operation after operation leading to disaster, blood poisoning sometimes following upon the most trivial procedures; and small wonder when the ligatures were pulled out of the pocket of a dirty dressing-gown. On the medical side, Professor Short continued, the physicians of the Infirmary shared the views of their time. A good deal of their treatment, especially in febrile cases, was bleeding, cupping, and purgation. Of J. C. Prichard, a great name on the honorary staff, a patient wrote:

> "He leaves his patients full of sorrow,
> They're cupp'd to-day and bled to-morrow."

One physician used to prescribe as his favourite remedy cobwebs, and the cellars of Bristol were scoured to provide them. Infirmary dinners in the old days were rough affairs, frequently ending in broken heads and bleeding noses, and none dare attend them without a stout cane. As for the nurses, it was related that a senior resident officer at one time had to stand in the lodge at night to see that the night nurse was sober enough to come on duty.

Pioneer Work

Yet in such a school, said Professor Short, great pioneer work was done. One servant of the Infirmary was Dr. William Budd, who saw in the villages of Devonshire the way in which epidemics like typhoid fever spread, and recognized the particulate nature of infectious disease, thereby laying the foundation of modern epidemiology. Another Bristol pioneer was Greig Smith, one of the fathers of abdominal surgery. Bristol remained abreast of modern developments, especially in team work. It was not possible nowadays for a man to be highly proficient in every branch of medicine, but if the whole of those responsible for the medical service of a community worked together as a team there was enough skill and experience to provide absolutely first-class service in every branch. To bring that about they in Bristol had a vision of one medical centre and one medical service, comprising alike the voluntary and the municipal hospitals, though this would take some time to achieve.

Meanwhile the President, Colonel P. G. Robinson, described a more immediate project on the way to accomplishment—namely, the amalgamation of the Royal Infirmary with the Bristol General Hospital, itself an old institution, though it cannot boast a double century. He said that this fusion was one of the steps which had been made necessary if the best resources were to be available and the fullest use made of them. He would not say whether the "marriage" was a love match or a marriage of convenience, or whether the Royal Infirmary was in the position of the wooer or the wooed; but everyone concerned was confident of a happy outcome. Those who had been in close touch with the arrangements necessary to bring about the amalgamation had been struck by the way in which individuals and groups had put aside private interests and had united to make the new order of things a success. Some years might elapse before the full benefits of amalgamation were seen, but it was certain that they would be forthcoming in the shape of a more specialized and therefore a better service for the public.

Historical Exhibition

A prominent feature of the reception by the Lord Mayor and Lady Mayoress (Councillor A. F. Moon and Miss Kathleen Moon) in the Bristol Museum and Art Gallery was an exhibition in Gallery VI of paintings, drawings, engravings, etc., of persons and buildings connected with the history of the Royal Infirmary. This exhibition was arranged by the Museum and Art Gallery Committee and its director, Mr. H. W. Maxwell. Detailed labels were attached to the exhibits, and a historical note giving further particulars about the Infirmary was distributed with the programme. One of the outstanding exhibits was a cup and saucer, part of a service made for Edmund Burke by his friend Richard Champion, who was treasurer of the Infirmary and owner of the Bristol pottery where the famous Bristol china was made. The exhibition remains open until to-day, Saturday, October 30.

At the close of the celebrations the President had the happiness to announce gifts totalling £3,550 from three benefactors.

DISORDERS OF THE LIVER

CONGRESS AT VICHY

The International Congress on Hepatic Insufficiency, held at Vichy from September 16 to 18, proved an unprecedented success. The inaugural meeting in the theatre of the Grand Casino was presided over by M. MARC RUCART, Minister of Public Health. The president of the Congress, Professor M. LOEPER, presented his opening address, and Dr. L. BINET, president of the Society of Medical Sciences of Vichy, officially welcomed the delegates from different countries. After the various international delegates had replied, M. Marc Rucart declared the Congress open.

Functional Tests

Professor K. GLAESSNER, in a paper on the functional tests for liver insufficiency, concluded that they were not yet precise enough for a diagnosis to be made on them alone. In the major forms of hepatic insufficiency functional tests were superfluous and clinical facts usually sufficed. In latent, mild, and incipient forms they did prove of value, not only in diagnosis but also in prognosis and treatment. Professor M. R. CASTEX and Dr. L. GARCIA dealt with the subject of pigmentary hepatic insufficiency, and described two forms—one dependent on canalicular involvement and the other on functional hepatic insufficiency. Professor L. BINET pointed out that sulphur in the hepatic tissues had long been recognized and that a sulphur compound, taurocholic acid, existed in the bile. Dr. E. URBACH dealt with the relation between skin and liver diseases, and Professor C. I. PARHON with the complex subject of the liver and endocrine glands. Dr. N. HAMILTON FAIRLEY, in a paper on hepatic insufficiency in malaria, said that jaundice might be haemolytic in type due to blood destruction or toxic in origin due to hepatitis, but the latter did not result in cirrhosis. Pigment stones sometimes resulted.

In the Medical Section MM. R. DEBRÉ, G. SEMELAIGNE, and E. GILBRIN, discussing idiopathic polycholia in children due to excessive storage of glycogen and fat, stressed its congenital origin and early onset, and regarded hepatomegaly and retarded growth as its two most important manifestations. Dr. M. J. OLMER reviewed the hepatic and extrahepatic factors concerned in oedema in diseases of the liver, and Drs. A. L. CRANDALL, C. IVY, W. N. ELTON, A. BASSLER, and H. I. GOLDSTEIN considered the relations of the liver and of nutrition to special aspects of the nervous system. MM. N. PENDE and M. BUFANO held that all conditions of hepatic vagotonia insured a good storage of hepatic glycogen and mobilization of fat, whereas in hepatic sympathicotonia hepatic storage of glycogen was decreased, the combustion of fats increased, disassimilation of cholesterol resulted, and there was acetonaemia and lactacidaemia.

In the Section of Therapeutics Professor B. O. PRIBRAM said that pre-operative and post-operative hepatic insufficiency was generally due to hepatitis. In mild cases only hepatic oedema was present, but in the more severe inflammatory exudate ensued. Ether was the only general anaesthetic permissible, while in cholaemia spinal and local anaesthesia were advocated. In cholaemic haemorrhage vitamins C and D were sometimes effective. Dr. F. GALLART-MONÈS considered dietary, and MM. M. PIÉRY and M. MILHAUD the role of hydro-mineral, therapy in relation to hepatic insufficiency. In their opinion Gilbert's old view, solidly supported by Geraudel, that hepatic insufficiency might result from either "hypo-hepatism" or "hyper-hepatism," had been unduly neglected and should be revived. Mineral waters activating the hepatic functions generally contained sodium bicarbonate as a principal component, whereas those capable of moderating the hepatic function included calcium and magnesium sulphate.

THE TUBERCULOSIS ASSOCIATION

VISIT TO PARIS

On the initiative of Dr. R. H. Hazemann, recently principal medical officer to the French Ministry of Health, and Dr. F. R. G. Heaf, Secretary to the Tuberculosis Association, the association this year paid a visit to Paris, staying there from October 14 to 16. In the absence of Dr. Roodhouse Gloyne, Dr. L. S. T. Burrell acted as president, supported by Sir StClair Thomson. A reception by the Comité National de Défense contre la Tuberculose was held at the Cité Universitaire—a hostel accommodating 3,000 students of all nationalities. The reception was followed by a banquet at one of the restaurants of the International Exhibition, given by the Ministry of Health and the Reception Committee of the Exhibition. The Minister of Health, in his speech of welcome, stressed the pioneer work of this country in public health administration, that of Sir Robert Philip in tuberculosis control, and of the Brompton School in thoracic surgery. On the two following days the members were received by the Mayor in the Hôtel-de-Ville and visits were paid to the Hôpital Laënnec and Dispensaire Léon Bourgeoise, the Pasteur Institute and BCG laboratories, the well-organized medical and social services of the Caisse Interdépartementale d'Assurances Sociales, the Ecole de Puériculture, the neighbouring city of Suresnes, with its unique open-air school and other "social" buildings, and the sanatorium of Franconville, an institution of 540 beds, equipped with a first-class surgical unit under the direction of Dr. Monod. The visitors were also given opportunities of seeing the International Exhibition under most favourable conditions. The warm welcome and generous hospitality accorded to the members of the Tuberculosis Association will leave a lasting impression among those who were present at what proved to be an instructive and enjoyable meeting, the success of which was in no small part due to Dr. Godard, in whose hands the arrangements of the visit were placed.

OBSTETRICIANS AND GYNAECOLOGISTS

COLLEGE DINNER IN LONDON

The seventh dinner of the British College of Obstetricians and Gynaecologists was held at Claridge's on October 22 with the President, Sir EWEN MACLEAN, in the chair.

After the loyal toasts had been honoured the health of "The College" was proposed by the Chancellor of the Exchequer, Sir JOHN SIMON. The influence of the College, he said, was of much value in raising the standard of obstetrical treatment, and would surely take a large part in reducing the maternal mortality figures. Its diplomas were recognized throughout the world as representing the highest standard of efficiency. The Midwives Act of 1936 was a great achievement in public health legislation. Nearly all the local authorities had now completed schemes under this new Act for the establishment of a service of midwives, and the concentrated co-ordinated effort, to which the College and the voluntary nursing associations were contributing, should bear fruit in the next few years. Sir John Simon expressed his pleasure at knowing that the College had also turned its attention to the improvement of maternity care in India, and held out the hope that it might receive a Royal Charter.

The Year's Work

Sir EWEN MACLEAN prefaced his remarks with messages of good will from colleagues over-seas, and also from Lord Dawson, P.R.C.P.Lond., regretting his unavoidable absence. In the past year the College had added a hundred new members and twenty-five new Fellows, and within the next year the total would reach 600, including ninety women. Of the total 250 lived over-seas—75 in Australia, 60 in India, 40 in Canada, and 15 in New

Zealand. The College had added to its select company of Honorary Fellows Mahfouz Pasha of Cairo, and Dr. George Gray Ward of New York whom they welcomed that evening. Among the honours received by Fellows Sir Ewen referred in particular to the presidency of the British Medical Association, now held by Professor R. J. Johnstone; and the distinctions conferred by the King on Sir Harold Beckwith Whitehouse and Mr. William Gilliatt. Lastly he mentioned the co-operation of the Central Midwives Board in the investigation into analgesia in midwifery, the link between them being Sir Comyns Berkeley; the work of Mr. Donald Roy, as librarian and secretary of the College at its headquarters in Queen Anne Street; and the services to the library of Dr. Arnold Chaplin, Harveian Librarian of the Royal College of Physicians.

Mr. Eardley Holland proposing the health of the guests welcomed twelve presidents of sister colleges and societies, who included Sir Cuthbert Wallace, P.R.C.S. Eng., Dr. W. T. Ritchie, P.R.C.P.Ed., and Miss Louisa Martindale, President of the International Medical Women's Federation. He said that the College had enjoyed throughout the friendship and support of Lord Dawson and Sir Cuthbert Wallace, and that of Lord Horder, who had been its adviser from the beginning. Lord Horder, in a brief reply, said that all the guests, with their varied outlooks and interests, were united as well-wishers of the College. Sir George Chrystal, Secretary of the Ministry of Health, who also responded to the toast, spoke of his long acquaintance with doctors during his career at the Ministry of Pensions and the respect and admiration he felt for the work of the medical profession. The Ministry of Health recognized the enormous advances made in obstetrics and gynaecology since the bad old days and knew it could rely on the help of the College in dealing with the problems of this restless age.

Reports of Societies

THE FUTURE OF PHYSICAL MEDICINE

At the meeting of the Section of Physical Medicine of the Royal Society of Medicine on October 15, Dr. F. D. Howitt, in a brief presidential address, said that as long as the view was allowed to exist that physical medicine was purely a treatment specialty its status must remain ancillary to medicine. No one sent a case to a dermatologist with the request for the application of a certain ointment, or to a cardiologist for the prescription of a certain drug. It was the duty of the physician, whatever his specialty, to examine the patient from every aspect, to review the remedies at his disposal, and to prescribe and alter his treatment according to the reactions which took place. There was an army of qualified technicians, thoroughly competent to carry out electrical, hydrological, and gymnastic prescriptions ordered by medical men, and they faithfully kept within the boundaries of their status. The application of physical treatment was the province of these technicians; the prescription was the province of the physician. It was not helpful to the prestige of physical medicine to suggest that the technical application of treatments was a matter of great difficulty, although the correct selection and prescription required a wide and comprehensive knowledge, not only of physiotherapy but of clinical medicine. Physical treatments were no more their monopoly than was the blood-pressure apparatus the monopoly of the cardiologist or the knee-jerk hammer that of the neurologist. But in difficult cases the opinion of the expert must be sought, and it was the duty of the leaders and investigators of physical medicine to direct and advise upon the various methods which might most advantageously be employed.

Dr. Howitt also touched on the systematized teaching of physical medicine. Certain of the Examination Boards now recognized the subject officially, but little provision was as yet made for it in their teaching syllabus or examination papers, with the result that the young doctor went into practice and was immediately confronted by a demand for physical treatments in which he had no training or experience whatever. It was a pity that the demand for physical treatments had come so forcibly from the lay public before the profession had had time to train its members efficiently. The result had been that the practitioner had been faced with the ignominious dilemma of either ordering electrical or radiation treatments to be carried out by a qualified masseuse or of installing apparatus himself without having learned even the rudimentary principles. The student must be instructed in the prescription of physical treatments as a matter of precision, such prescription only to be made after an exhaustive review of the clinical condition, the findings with the various aids to correct diagnosis, and in conjunction with such specific remedies as the nature of the individual case demanded. Lastly, the student must be instructed in the correct assessment of the importance of psychology, both in the aetiology of chronic ill-health and also in its particular influence in physiotherapy. He concluded with a remark of the late Sir Alfred Fripp, that the student in the choice of his career might decide either to be a big fish in a little pool or a little fish in a big pool. Physical medicine was a big pool, constantly replenished from many streams; it was a pity, with such opportunities, to remain in the shallow waters of restricted endeavour.

Sir Robert Stanton Woods said that there were physical agents which either had been so long in use or were so well understood that their administration might with safety be entrusted to the technician, and, at any rate without fear of active harm, be prescribed by the majority of medical men; but there were others which, perhaps from newness, were potentially dangerous, and therefore needed the control of special skill or of such experience as their novelty permitted. With it all the mental outlook must be based broadly upon a knowledge of medicine. Dr. C. W. Buckley agreed with the President that the foundation of physical medicine must be a sound clinical training. Unless a man was a good physician he was likely to be an indifferent practitioner in the specialty he represented.

Dr. C. B. Heald touched on the question of a postgraduate diploma. He had doubted whether this was feasible, partly because he could not see a suitable ring-fence round the syllabus, and partly because the lack of keenness in the subject made him wonder from what source the potential panel of examiners would come. But if the Section decided that it was its business to sponsor on the medical side the new national move for the assessment of physical welfare and physical education, not only would it be possible to make the syllabus of the postgraduate diploma of real value, but a field of new recruits would be opened up. Recruits for whom a diploma in physical medicine would be valuable were examiners for insurance companies, medical officers for schools, medical officers of the services associated with recruiting, and medical officers in firms concerned with over-sea personnel or employees' welfare.

Dr. F. G. Thomson said that, while there were certain physicians who practised physical medicine and certain surgeons who practised what might be called physical surgery, the general physician and surgeon had the most elementary knowledge of what was required, and though he might send his patient to someone representing one or other branch of physical medicine, yet if one branch only were practised the criticism would be made at once that practitioners of physical medicine treated all diseases by the same method. Dr. G. B. Batten mentioned the need for research. If as much research had been done in physical medicine, especially in bio-electrology, as had been done in radiology the position would be very different.

Dr. J. B. Burt said that as long as doctors casually sent their patients to a masseuse regardless of prescription practitioners of physical medicine must lose caste. He did not mind being a small fish in a large pool, but he did object to being a worm! Dr. A. R. Neligan remarked that with the increasing demand for practitioners of physical medicine the specialist in this field must be developed by postgraduate study. Dr. E. B. Clayton also suggested that the teaching of physical medicine would have to be much more a postgraduate subject. Dr. C. L'Estrange Orme thought that the prescription of physical medicine was an art, and it was important to have a choice of suitable measures. To assess the treatment of sciatica by ionization without regard to massage or manipulation was rather like asking the cardiologist to assess the treatment of rheumatic heart disease by salicylates alone.

EPIDEMIOLOGY OF ENCEPHALITIS LETHARGICA

At a meeting of the Section of Epidemiology and State Medicine of the Royal Society of Medicine, on October 22, Sir Arthur MacNalty, Chief Medical Officer of the Ministry of Health, delivered his presidential address, taking as his subject the epidemiology of encephalitis lethargica.

He said that when encephalitis lethargica appeared in this country in 1918 it was a "blast from the stars," as Willis might have termed it. It was, to all intents and purposes, a new disease, the pathology, clinical features, and epidemiology of which had to be worked out from the beginning. Later the description given by von Economo of the disease as it had prevailed in the previous year in Vienna became known. Medical observers afterwards discovered other examples from the past. Some considered that the first account of an epidemic of encephalitis lethargica was Sydenham's account of an epidemic, which he called *febris comatosa*, in London in 1673–5, the symptoms resembling those of encephalitis lethargica with hiccup among them. Why did encephalitis lethargica reappear in an epidemic form in 1918 and rapidly become so prevalent that in a short time outbreaks were reported from all quarters of the globe? One reason was the increased subjection of the central nervous system to attacks of epidemic disease. Modern methods of transport facilitated the spread of infection, and increased urbanization of the population and the movements of troops to different parts of the world helped to account for the increased frequency of epidemic nervous diseases. The possibility of such diseases occurring in epidemic cycles, as influenza did, had also to be considered. Again, in considering the seed it was well not to forget the soil. The nervous system to-day was subjected to more frequent and urgent stimuli than formerly, and fatigued or overworked tissues might thereby be rendered more susceptible to the attacks of invading organisms. Another consideration was the possibility of the evolution of new organisms affecting the central nervous system, owing to the assumption of inimical characteristics by originally harmless parasites, organisms usually causing catarrh of the nasopharynx or gastro-intestinal tract tending to affect the brain and spinal cord. None of the speculations advanced as to the advent of encephalitis lethargica was capable of scientific proof, and much had still to be learned about the laws under which outbreaks of epidemic disease were initiated.

The Virus of Encephalitis Lethargica

There seemed little doubt, Sir Arthur MacNalty continued, that encephalitis lethargica was due to a filterable virus. He recalled the experiments by McIntosh and Turnbull (1920) in this connexion. As with cerebrospinal fever and acute poliomyelitis, it seemed a fair assumption that the virus first affected the upper respiratory passages; here it might either lurk and give rise to the carrier phase in the person affected or pass on to attack the brain. There was no definite catarrhal stage associated with the early manifestations, but sore throat was a frequent concomitant. In view of the frequency of initial conjunctivitis, the virus might possibly reach the brain by the orbital route; infection by the gastro-intestinal route was also a possibility.

The evidence for regarding encephalitis lethargica as an epidemic disease was next considered. The chief factors relating to the spread of encephalitis lethargica by personal contagion were summarized as follows: (1) The restricted topographical distribution of cases; a tendency for examples to clump in certain areas of towns had been noted in Sheffield, Bristol, and elsewhere. (2) Examples of multiple cases in families and localized outbreaks in small communities. He mentioned an institutional outbreak in a home for girls at Derby in 1919, when twelve out of twenty-two inmates were attacked. (3) Examples of case-to-case infection in which infection from a common source was apparently excluded had been reported. (4) The association of mild and ambulant cases with declared cases had been shown, and through the medium of the former the conveyance of infection from one person to another appeared more than probable. The epidemiological concept of encephalitis lethargica was therefore similar to that of various epidemic diseases of the central nervous system; thus, while associated groups of cases or definite epidemics sometimes came to light, the ordinary train of evidence was that only here and there did the widespread infecting agent find an individual who reacted with an unmistakable illness manifested by a characteristic syndrome. Alternatively, the agent might infect the individual with such a massive dose or in such a special manner that the characteristic disease was produced. In other words, for every definite and characteristic case of encephalitis lethargica there was a large and indeterminate number of people who received and carried the infection without themselves suffering noticeably, or indeed at all.

Other Forms of Epidemic Encephalitis

Other forms of epidemic encephalitis existed. During the past fifteen years, Sir Arthur MacNalty said, he had seen a number of sporadic cases of polio-encephalitis in addition to the examples occurring in epidemics of poliomyelitis along with the spinal form of the disease. There could be little doubt, as was evident in the Broadstairs and other recent outbreaks, that the virus of poliomyelitis in some instances displayed a tendency to attack the brain rather than the spinal cord. This cerebral type of poliomyelitis had to be distinguished from encephalitis lethargica. In Japan several outbreaks of encephalitis had occurred during the past hundred years, the most recent epidemic, in 1935, causing about 5,000 deaths. The disease was due to a filterable virus transmissible to monkeys and rabbits, and was distinguishable both clinically and pathologically from encephalitis lethargica. He related other instances from Australia and America to indicate that the epidemiologist must not accept every outbreak of epidemic encephalitis as one of encephalitis lethargica. Equally this term should not be given as the description of every case of encephalomyelitis of unknown origin.

One of the characteristic features of epidemics of encephalitis lethargica was the different types of nervous manifestations which they presented. From a clinical point of view three types were broadly distinguished: (1) general disturbance of the functions of the central nervous system but without localization; (2) various localizations in the central nervous system; (3) mild or so-called abortive cases. The characteristics of one clinical type were often shared by another, and it was sometimes difficult to say which characteristic predominated. The various types in an epidemic showed signs of a common identity, not only by their general symptomatology, but by the gradual merging of the cases

of one type into those of another. In each single epidemic certain types predominated—for example, in one epidemic the lethargic ophthalmoplegic type prevailed, in another the bulbar paralytic, amyostatic, or hyperkinetic. These might seem to be different diseases were it not for their simultaneous appearance in one and the same epidemic. In spite of the protean aspect of encephalitis lethargica there was overwhelming evidence from the clinical, pathological, and epidemiological standpoints that it was an independent disease, and distinguishable from the other forms of epidemic encephalitis which were occurring and which were being identified.

The disease had been notifiable in England and Wales since 1919. The year of highest incidence was 1924, when 5,039 cases were notified with 1,407 deaths. Since that year the incidence had gradually declined, and from 1930 onwards the deaths as aftermaths of the severe epidemic incidence had exceeded the notifications. In 1936 269 cases were notified and there were 686 deaths. The epidemiologist could not dogmatize upon the future behaviour of this malady. He could only hope that the declining incidence meant that it would become rare enough again to disappear from the records.

THE CONTRIBUTION OF ADLER TO PSYCHOLOGICAL MEDICINE

The Medical Society of Individual Psychology held its inaugural meeting of the session on October 14. The Society's programme for the winter includes a symposium on the contribution of Alfred Adler (who died last June) to psychological medicine. This will take the form of four papers, the first of which was read by Dr. H. C. Squires on October 14. The other three will be: "Organ Inferiority," by Dr. Cuthbert Dukes, on November 11; "The Contribution of Adler to General Medicine," by Sir Walter Langdon-Brown, on December 9; and "The Relation of the Sexes," by Dr. O. H. Woodcock on February 10, 1938.

In his address Dr. H. C. SQUIRES, after drawing a picture of Adler's impressive personality as an original thinker, an uncompromising fighter, a dominant leader, a wise and sympathetic teacher with a ready wit and a keen and discerning flair, referred briefly to the circumstances of his day and generation. Pre-war complacency in medicine had given way to many spectacular advances, especially in the domains of biochemistry and psychology, and in psychological medicine attempts were now being made to consolidate the positions won and to secure where necessary modifications in their alignment. Psychological medicine seemed to be aiming not so much at a correlation of the views of the founders of the three main schools of psychological thought as at an attempt to create a presentation that was more comprehensive than any one of them. Adler's contribution on the theoretical side was a study of the personality as a purposive, controlling activity. On the question of treatment Adler always stated that his objective was the increase of social interest in the individual. It was emphasized that the effective use of such a method was an art that could only be acquired by different individuals in different degrees. Adler regarded dreams as a symbolic representation of problems which the individual felt inadequate to solve in a realistic fashion, and he laid stress upon the importance of the effect or feeling that the dreams might generate. In respect to the prevention of neurosis and delinquency, Adler advocated co-operation with the teaching profession for the recognition of potentially neurotic and delinquent children, who could then by appropriate treatment be helped towards a socially adjusted life.

Adler had been adversely criticized for popularizing psychology. He certainly believed that the approach to life problems that he had to offer was in the nature of an educative process, in which many could participate—especially members of those professions and callings which were concerned mainly with the human element. But he would have the medical profession, as the guardian of the public health, control medical treatment in all its forms, though at the same time it should not disdain the help that others outside the profession could give in an ordered and prescribed fashion.

HEALTH AND EXERCISE

At the first meeting of the session of the West London Medico-Chirurgical Society, held at the West London Hospital on October 8, Dr. D. G. RICE-OXLEY, in a presidential address on health and exercise, said that the object of physical culture was to maintain a high standard of physical and mental efficiency. To this end games were important, but they were, after all, only the specialized ends of physical training and the proper development of the body. The basis of physical education was to train the body to acquire correct carriage when standing or sitting, good style in running and walking, and the habit of correct breathing, while modern physical exercises aimed at producing normal mobility, strength, control, and agility. Dr. Rice-Oxley spoke in particular of the importance of maintaining the normal mobility of the back. Reduced mobility was the beginning of deformity which led to ill-health. The real strength lay in the muscles of the trunk, and not of the limbs, especially in the condition of the large muscles of the back and abdomen, and many of these deformities were due to the fact that in the past physical training tended to develop arms, shoulders, and legs at the expense of the development of the back, which had been injured by burdens to which the limbs subjected it.

Local News

ENGLAND AND WALES

Chelsea Clinical Society

The annual dinner of the Chelsea Clinical Society was held at the Rembrandt Hotel on October 19, under the presidency of Dr. T. A. Butcher. The toast of "The Society," with which was coupled the name of the president, was proposed by the guest of honour, the Earl of Athlone. Lord Athlone sketched briefly the history of the society, which was founded in 1897 by the general practitioners of Chelsea. Its meetings were held at a general dispensary and there were only thirty-four members. Since that time the influence and the prestige of the society had grown steadily, and its membership was now over 200. In replying to the toast Dr. Butcher pointed out that this was perhaps the first time in the history of the society that they had had the privilege of entertaining at one and the same time the Chancellor, the Principal, and the Member of Parliament for London University. He gave some account of the activities of the society at its monthly dinner-meetings, at which discussions were held on all aspects of medicine. The programme for the coming session included topics as diverse as medicine and surgery in ancient Egypt and modern methods of crime detection. Dr. Butcher paid tribute to the work of the two secretaries, Mr. A. Rugg-Gunn and Mr. H. Paxton Baylis, and to Dr. K. E. Eckenstein, who had been treasurer for a period of twenty-six years. He then presented Dr. Eckenstein with a silver cigarette box as a token of the society's esteem. Dr. Eckenstein responded briefly and thanked the president and the society for their good wishes. The toast of "The Guests" was proposed by Mr. F. J. McCann, who

referred to the distinguished career of Lord Athlone and particularly to the work he had done in South Africa during his long tenure of the office of Governor-General, and also as chairman of the council of the Middlesex Hospital and as Chancellor of the University of London. Sir Ernest Graham-Little, M.P., Mr. J. E. H. Roberts, the president of the Medical Society of London, Mr. H. L. Eason, Principal of the University of London, and the presidents of the West London Medico-Chirurgical Society and of the Hunterian Society were among the other distinguished guests present. In replying to this toast on behalf of the guests Sir Ernest Graham-Little pointed out that more and more students of the medical schools of London were entering for the University of London's examinations. The University was soon to have completed "a visible habitation," and it was to have the honour of conferring an honorary degree on Her Majesty the Queen.

The London Medical Exhibition

Although the Royal Horticultural Society's new hall at Westminster is one of the most spacious (and incidentally one of the most pleasing) exhibition interiors in London, it was taxed to capacity for the London Medical Exhibition which was held there during the third week in October. Many firms with a multitude of products had to learn the technique of compression. The exhibitors numbered 120, and between them staged a comprehensive display of medicinal preparations, foods, and instruments. It was a testimony to the thoroughness, skill, and ingenuity in laboratory, workshop, and showroom which are enlisted in the service of the medical profession. One felt increasing admiration for the way in which medical material and accessories are made to appear attractive, with pleasant colours, flavours, and scents. The general impression was of elegant pharmacy and highly polished and efficient instrumentation. Most of the stands were occupied with chemical and pharmaceutical products. The visitor was faced on entrance by five large stands of leading drug houses. Burroughs Wellcome and Co. gave evidence of their continual research, among their recently introduced products being sulphonamide-P for use in streptococcal and other infections, and their protamine insulin (with zinc) suspension. Parke, Davis and Co. had a comprehensive exhibit, prominent in which were highly potent concentrates of vitamins in convenient capsule form. British Drug Houses made a feature of anahaemin, sex hormone, and vitamin products, and a pleasantly flavoured preparation of calcium mandelate. Allen and Hanburys, among several new preparations, called attention to ascorbic acid (vitamin C) in bottles of twenty-five tablets, and Boots Pure Drug Co. had a range of preparations for the treatment of anaemias, and a similar range of antiseptics. At other stands, among the preparations which were stated to have been brought out since the exhibition was held in the same hall a year ago, were vitamin B_1 in pure form for injection purposes, by the Crookes Laboratories, and, from the same house, a new non-poisonous, non-irritant antiseptic, introducing the principle of "broadened specificity" and giving clear dilutions; and a liver extract, shown by Glaxo Laboratories, representing one of the highest concentrations ever achieved in large-scale manufacture. The British Oxygen Company had on view eleven models of portable gas-analgesia machines, with an inexpensive type of flow-meter and humidifier shown for the first time. The use of carbon dioxide in general practice and dental treatment was demonstrated by Sparklets Limited. A newly designed electrocardiograph was shown by the Victor *X*-Ray Corporation. Radiological apparatus was not greatly in evidence, but the Medical Supply Association had a portable machine with an output of 15 milliamperes at 90 kilovolts.

Among many neat devices was a "pocket laboratory" for complete blood and urine analysis, the contents being sufficient for 2,500 tests at a cost of one farthing a test. A display of cosmetic artificial features—so-called "aesthetic prosthesis"—designed for sufferers from facial and other disfigurements, called attention to itself. Another stand proclaimed that it had the most comprehensive and varied range of contraceptives yet exhibited. First-aid dressings with a non-frayable edge were commended. There was a photographic outfit for automatically recording the blood-sedimentation rate. Another exhibitor demonstrated a moulding process for making replicas of skin diseases and wounds in order to facilitate study of the progress of healing and scar formation. Indeed, the list of interesting devices could be indefinitely extended. The stands of Bath, Buxton, and Harrogate, and those of half a dozen publishers, came as pleasant variants to the manufacturing side of the exhibition.

The Caldecott Community for Children

A meeting in aid of the Caldecott Community for children from abnormal homes was held at the Mansion House, London, on October 19, under the presidency of the Lord Mayor, with the Archbishop of Canterbury and the Earl of Lytton as the principal speakers. The Caldecott Community is a new social experiment. It exists for the benefit of normal children from abnormal or broken homes, and its purpose is to ensure that such children shall not be permanently affected by the unhappy or unsuitable conditions of their home life but shall have the same chance as more fortunate children of growing up into good citizens. Under the term "broken home" are included homes in which severe friction exists between the parents, where the parents are separated or divorced, where one parent is dead and the other incapable of looking after the child, where there is chronic illness of a parent or a state of drunkenness or crime, where the child is illegitimate and therefore devalued, or where there is an unkind step-parent. In a large Georgian house named the Mote, in the middle of a park at Maidstone, Kent, the eighty-two children of this community, of ages ranging from 1 year to 16, are sheltered. The average payment made on behalf of each child by the parents or from other sources is £36 a year, but the cost per child, including everything—medical attention, education, and so forth—cannot be kept below £68; hence a public appeal for endowment for an institution such as society must ultimately recognize to be an essential part of its structure.

The Archbishop of Canterbury referred to the pathetic situation of children from homes—unhappily increasing in number—where one or other parent had been divorced, or from homes which for other reasons, moral or physical, were unstable. He said that the children and staff in the Caldecott Community worked together as members of one family, and every effort was made to discover, develop, and perfect the personality of the child. Lord Lytton quoted the remark of a six-year-old girl, a member of the community, who had never known a real home: "We like it here; we feel very safe." Miss L. M. Rendel, one of the honorary directors of the community, said that the children were of a very intelligent type, and with the serene background of the home an endeavour was made to ensure for them an atmosphere rich in culture, with discipline, hard work, good conditions of living, and good food. The children in the community are divided into five interdependent groups. There is first the nursery child, under 6 years of age; then—one of the most difficult and restless groups—the child just above nursery age; then the pre-grammar school child, from the mental age of 7 to 11 or 13; and then the senior. There is also a small group of children of varying ages—intelligent children presenting special difficulties, some of them sent by child guidance clinics. It is held to be very important to detect the earliest signs of instability and to see that the individual is readjusted to life. But the main purpose of this movement is preventive—to nip in the bud what might lead to juvenile delinquency or to nervous disorder in later life.

Correspondence

Pharmacology in the Curriculum

Sir,—Professor B. N. Ghosh in the *Journal* of September 11 (p. 552) deals very clearly with the present-day defective system of teaching pharmacology. When I was a student pharmacology was taught in the pre-clinical period, and by the time we reached the final year it was mostly forgotten. Therapeutics were taught by physicians in the wards, who gave scanty attention to the subject, so that we began to regard the treatment of disease as of secondary importance. Even the leading textbooks of medicine dealt very meagrely with the subject. The result was that a newly qualified physician experienced a good deal of difficulty in practice when patients demanded more than the mere diagnosis of their ailments.

The incorporation of pharmacology with therapeutics was a distinct step forward, but it is still far from ideal, simply because the teaching of therapeutics in the pre-clinical period is a sheer waste of time. In my opinion applied pharmacology should be taught in the wards by a pharmacologist, who should be in charge of clinical beds. Systematic lectures should be fewer in number, and there should be more demonstrations of the actions of drugs on patients in the wards. The student should be trained in observation and in the use of his critical and reasoning faculties. If real progress in the teaching of pharmacology is to be made, the sooner we discard the older methods of teaching the better, otherwise we will go on producing more and more stereotyped parrots instead of scientific physicians.—I am, etc.,

Lahore, Oct. 18. Ilahi Bakhsh, M.D.,
Captain, I.M.S.,
Professor of Pharmacology and Therapeutics,
King Edward Medical College.

Adult Serum in Measles

Sir,—Sir Kaye Le Fleming (*Journal*, September 25, p. 612) is to be congratulated on having taken the opportunity of using "adult" serum in a measles epidemic in a public school. If there have been previous similar attempts in other public schools it is to be regretted that details have not been published, as the subject is of very great importance to them. No one doubts the efficacy of "convalescent" serum treatment properly applied. The evidence supplied in the L.C.C. reports of 1933 and 1936 is convincing, and I am sure that all medical officers of public schools are only too anxious to make use of serum treatment, while the subject has been frequently discussed by the council of the Medical Officers of Schools Association. One school has indeed prepared a supply of convalescent serum and suggested forming a public school pool. But the difficulties in adopting the right procedure have been very great, though the principle may be beyond dispute. A wrong application in dealing with large masses of boys or girls at this stage is most undesirable.

The first difficulty is in obtaining convalescent serum: it is not to be got, except for individual cases. The second is that until quite recently the value of adult serum has remained *sub judice*. The third difficulty lies in deciding the right time to give the serum. Since, I imagine, most public school medical officers consider it quite unjustifiable to prevent temporarily an attack, apart from most exceptional cases, and believe that attenuation is the essential thing to be aimed at, the use of convalescent serum by the rather general and wholesale method adopted by Sir Kaye Le Fleming would be inadmissible, because it would "prevent" a certain number of cases, which might subsequently be affected, thereby discrediting the treatment and the doctor. But the great value of his experience lies in his statement that the use of adult serum does attenuate an attack, to some extent at least, during a school term, whether given in the early incubation stage or before exposure. It may be true that the mere statistical results he gives are not very convincing—for example, in the comparative number of complications and length of the period of pyrexia in the various groups—and we all know that measles epidemics in schools vary considerably in virulence, but his conviction of the clinical evidence of attenuation must carry great weight.

It is a common experience that the first batch of cases after the original one always includes more than the known and probable close contacts. The conclusion to be drawn from this seems to be that we should advise parents that all susceptibles should be given adult serum within a week of the onset of the first case, without, however, making too extravagant claims as to what adult serum given in this way can accomplish. No doubt the opportunity will be given to many public school medical officers to corroborate Sir Kaye Le Fleming's observations next term if adult serum can be obtained in sufficient quantity. Is not this question of an adequate supply of serum a matter of national importance? The public schools are only a fraction of the population which would benefit by this treatment.—I am, etc.,

L. R. Lempriere,
Oct. 20. Medical Officer, Haileybury College.

Adult Whole Blood in Measles

Sir,—In the last measles epidemic I had to face the problem of protecting young and often weakly contacts in an impecunious neighbourhood. I used 5 to 8 c.cm. of whole blood taken from one or other of the parents and injected immediately after it had been withdrawn. Of ten children so treated one had a moderate attack, four or five had attacks so slight that the diagnosis at another time might have been in doubt, and either five or four children had no attack at all. For convenience, promptness, and cheapness the method is obviously excellent.

Its disadvantages include the risk that the parent's memory of having had measles may be at fault, and the possibility of the parent having contracted syphilis after the birth of the particular child. The latter possibility can be minimized by tactful questioning. I should welcome the views of other readers as to whether the method is justifiable or can be improved on. Has anyone else been using it?—I am, etc.,

Woodford Green, Oct. 20. E. B. Grogono.

Tuberculosis of the Cervical Lymphatic Glands

Sir,—In the valuable article by Mr. Reid and Dr. Wilkinson in the *Journal* of October 16 (p. 740) on tuberculosis of the cervical lymphatic glands, there are certain statements in the section dealing with pathology which invite comment and which would appear to require further investigation.

The authors state that in the series of 119 cases, in no instance were "secondary" lesions found elsewhere. How far is this true in other parts of the country? Our experience in this area would suggest that a combination of cervical gland tuberculosis with pulmonary disease is

not uncommon. Again, it is surmised that cervical gland infection may successfully protect the individual throughout life against tuberculosis. This, of course, is the old teaching. How far is it indeed now true? Looking through some of the admissions to the Osler Pavilion in the past ten years we are not satisfied that it is by any means always so.

It would be instructive to hear the views of others engaged in tuberculosis work, or, better still, to have other series of cases in detail.—I am, etc.,

Oxford, Oct. 18. WILLIAM STOBIE.

Local Treatment of Coryza

SIR,—I have been struck by the remarkable therapeutic effects of the instillation of lipiodol into the lung when carried out as a diagnostic procedure in cases of bronchiectasis or chronic bronchitis. A number of patients on whom I had performed a diagnostic lipiodol bronchography have come back after a time asking for another instillation of the oil, from which they had obtained much relief. The therapeutic results might be explained by the oil forming a thin layer on the bronchial mucosa. This cuts off the supply of oxygen to the micro-organisms responsible for the inflammatory changes, causing them to be asphyxiated and thus giving the mucous membrane a chance to recover. These considerations led me to adopt a treatment based on similar principles in dealing with coryza.

The virus responsible for coryza seems to require plenty of oxygen, and for this reason it thrives in the upper respiratory passages. Nature's cure for coryza is swelling of the nasal mucous membrane with consequent blocking of the passages, resulting in asphyxiation of the virus. On this hypothesis it is wrong to try to decongest the swollen mucous membrane by the use of preparations such as ephedrine, etc. An imitation of Nature's cure would be the coating of the mucous membrane with a thin layer of oil, which would cut off the supply of oxygen to the virus. At the same time it might be advantageous to incorporate some mild non-irritant antiseptic in the oil. The coating with oil is best achieved by means of an atomizer. Provided the treatment is begun early enough and repeated at frequent intervals coryza does not develop. This at least has been my own personal experience. In cases in which the coryza is already far advanced the flow of the secretion washes away the layer of oil, and the treatment is ineffective.—I am, etc.,

London, W.1, Oct. 20. A. ORLEY.

Aetiology of Erythema Nodosum

SIR,—In view of recent correspondence in the *Journal*, may I offer a few remarks on the aetiology of erythema nodosum? On the one hand erythema nodosum is related to tuberculous lesions of the skin, including Bazin's disease or erythema induratum and the papulonecrotic tuberculids of Darier. Erythema nodosum of tuberculous nature presents small multiple lesions of subacute course. Sometimes they pass directly into an indurated state. Secondly, erythema nodosum may be allergic and especially associated with streptococcal lesions. In such cases the nodes are not numerous but are large and shiny. They readily disappear and never suppurate or indurate.

The old notion that erythema nodosum may be the rash of an acute specific fever (nodal fever) was revived by Dr. Lendon of Adelaide in 1905 and again in 1923 by Professor Maxwell Telling of Leeds. The alleged association between erythema nodosum and rheumatism can be traced to a paper by Mackenzie in the Clinical Society Transactions of 1886. This paper has been incessantly quoted since it was written, but it is merely a review of material collected by the author from other sources, and it contains information such as "father rheumatic" and "heart sounds murmurish."—I am, etc.,

Sunderland, Oct. 18. G. F. WALKER, M.D., M.R.C.P.

Idiosyncrasy to Prontosil

SIR,—The explanation offered by Dr. Hugh Woods (*Journal*, October 23, p. 828), that the febrile reaction provoked in certain patients by the oral administration of prontosil is due to the destruction of large numbers of bacteria, was the one that occurred to me when I first observed these reactions, particularly as in one case, mentioned to me by Dr. D. Erskine, the fever was accompanied by a scarlatiniform erythema. But three patients —one of whom was not referred to in my previous letter—have told me that when, at my suggestion, they took the prontosil again, one tablet sufficed to cause a recurrence of the fever with its accompanying symptoms. If this is true, it is, I think, more likely that the question is one of idiosyncrasy to the drug, and, as my colleague Dr. Forman has pointed out, similar febrile reactions may occur in certain persons following the administration of luminal or medinal. Moreover, if prontosil causes such reactions in cases of chronic focal infection owing to the direct action of the drug on the bacteria with the consequent liberation of toxins, one would surely expect far more severe reactions, with possible fatal results, in patients with acute infections, such as erysipelas or septicaemia.—I am, etc.,

London, W.1, Oct. 22. H. W. BARBER.

Sulphanilamide in Gonococcal Infections

SIR,—An investigation was recently begun at this hospital on the treatment of gonorrhoea in the male with sulphanilamide, and the results, so far as can be judged at this early date, are most satisfactory. All cases considered in this communication were treated as in-patients and were not discharged from hospital till they could be regarded as cured. Considerable difficulty was experienced in finding an effective dosage for early acute cases, and it was only when large doses were used that good results were obtained.

Most of the twenty-one early acute cases to be reported on have been treated with 90 grains of sulphanilamide daily for four days, this being followed by a daily reduction in the dose of 20 grains. Other cases received slightly smaller doses. Fifteen of these twenty-one cases were irrigated with potassium permanganate, 1 in 12,000, twice daily during, and for three days after, the sulphanilamide treatment, but the remaining six received no irrigations. All the patients were kept in bed and were given an alkaline mixture during the seven-day course of sulphanilamide treatment. In fourteen of these twenty-one cases the urethral discharge had ceased and the urine was free from pus in forty-eight to seventy-two hours, and in only two cases were gonococci seen after twenty-four hours had elapsed from beginning treatment. These cases made uninterrupted recoveries without complications, and their average stay in hospital was three weeks, after which time they were discharged as cured; none has since relapsed.

The remaining seven cases were failures—five behaved at first as did the previously described successful cases, becoming dry in forty-eight hours, etc.—but a few days after the cessation of potassium permanganate irrigations they relapsed, showing gonococci in their urethral smears. The remaining two patients, one of whom was not irrigated, were apparently

unaffected by the drug. In view of these five relapses it was thought that perhaps the astringent effect of the potassium permanganate was protecting areas of infection from the action of sulphanilamide, and in consequence treatment without irrigations has now been adopted as a routine. No relapses have occurred among the cases so treated. With regard to the two cases which were unaffected by the drug, it seems possible that sulphanilamide may only be effective between a certain range of *p*H values. This would appear to be a subject for investigation. Blood examinations showed, in a few cases, a slight haemoglobin reduction, and a small increase in lymphocytes was also noted, but otherwise no important variation in the white cell count occurred. The patients suffered from no obvious ill-effects.

Treatment was also carried out in twenty-six other cases, with histories of infection ranging from one to five months. The dosage varied from 15 grains, three times a day, to the larger amounts described above. All these cases have cleared up in a most satisfactory manner, and I have now none of them remaining in my wards, all having been discharged as cured. In addition to the administration of sulphanilamide the usual routine treatment for gonorrhoea was carried out in these cases. Sulphanilamide appeared to have a most favourable action on cases complicated by arthritis, acute posterior urethritis, and epididymitis. So far as can be judged from early results on a small number of cases, it would appear that sulphanilamide has a definite action on the gonococcus and will prove of great value in the treatment of infections due to it.—I am, etc.,

O. J. O'HANLON,
Major R.A.M.C.

Connaught Hospital, Aldershot, Oct. 17.

Brown Bread versus White

SIR,—I have been very much interested in the leading article in the *Journal* of October 16 on the question of brown bread, which sums up very admirably the state of medical opinion with regard to the deficiencies of white bread. I spoke on this matter at a maternity and child welfare conference held in Liverpool in 1936, and then made a suggestion that in order to get any practical advantage from modern knowledge it is essential that some person or body of persons in authority should give an informed statement as to how brown bread can be prepared in such a way that the vitamins are not removed. This in effect means that there should be a milling prescription which a miller could use in the preparation of a standard brand of flour. A person desiring brown bread with its appropriate complement of vitamins could therefore demand bread made from flour milled in accordance with this prescription. With such a safeguard he would be enabled to obtain what he needs at the present time but which he is unable to obtain.

It is time that the Ministry of Health, the Medical Research Council, or some other authoritative body took up this matter and gave an official pronouncement.—I am, etc.,

C. O. STALLYBRASS.

Liverpool, Oct. 25.

Physiology of the Stomach

SIR,—The comparative figures of carcinoma of the stomach in a London and an Amsterdam hospital, given by Sir Arthur Hurst in his Harveian Oration (*Journal*, October 23, p. 783), interest me very much, because of confirmatory observations made by my wife and myself over a period of ten years. It happens, for various reasons, that we have visited many families in Holland, and that they have visited us here. We have both commented upon the speed with which our Dutch friends swallow their food. At many a dinner table we have found ourselves hopelessly behind in the race, and have guessed at the urgent signals (in Dutch) sent out by our hostess for the family to hold back. In the same way, when we have been the hosts in London, we have found ourselves finishing in a hurry in order not to delay our guests. Now, this observation of ours of eating habits in Dutch families, most of whom are moderately well-to-do, complements the figures given about 500 people, presumably having rather small incomes, seen at the Wilhelmina Gasthuis. It would seem, then, that both rich and poor in Holland are quick eaters.

Some interesting international comparisons on these lines are possible. Did not an Australian physician, whose name I cannot remember, recently offer evidence that the decline of Rome had been due to malaria? What about the diet and decline of the Roman Empire—or, indeed, of several other empires?—I am, etc.,

REGINALD HODDER.

London, S.E., Oct. 23.

Magnesium Trisilicate

SIR,—Dr. N. Mutch in his article on magnesium trisilicate (*Journal*, October 16, p. 735) quotes the *Pharmaceutical Journal* (1936, **136**, 721) as a reference to the paper on this subject which I read at the British Pharmaceutical Conference in 1936. This paper was reported in full in the *Quarterly Journal of Pharmacy and Pharmacology* (1936, **9**, 445), whereas a brief extract only appears in the *Pharmaceutical Journal*.

Had Dr. Mutch read the official report quoted in the *Quarterly Journal of Pharmacy and Pharmacology* he would probably have modified certain of his statements.

In the same sense, the reference made by Dr. Mutch to comments by Mr. Ragg is misleading in so far as Mr. Ragg raised certain points in the verbal discussion which followed my paper, which points were, with others, dealt with satisfactorily at the time (*Quarterly Journal of Pharmacy and Pharmacology*, 1936, **9**, 545). I am sure that Mr. Ragg would be the first to agree that his remarks hardly justified the special place given to them in Dr. Mutch's list of references.

As was explained in my paper and amplified at the meeting of the British Pharmaceutical Conference, I am well aware of the limitations of the analytical methods I use; but as applied to the magnesium trisilicate of commerce they are rapid and of sufficient accuracy. They enable the analyst to discriminate between good and indifferent material, and they enabled me to make a preparation in every way equal to that championed by Dr. Mutch. Furthermore, in spite of the analytical work being "carried out with meticulous care," the table now given by Dr. Mutch shows the same vagaries and inconsistencies which I myself found and commented upon. For example, the full 100 per cent. of the material is not accounted for, and the bases found do not quite agree with the antacid values, while the ratios are calculated on the unwarranted assumption that the iron, calcium, and aluminium are uncombined with silica and that the magnesium alone is so attached.

But none of these points detracts from the practical value of Dr. Mutch's confirmation at the British Medical Association meeting this year of the principle laid down at the British Pharmaceutical Conference in 1936, that it is essential that only the true substance, as originally used by Dr. Mutch, should be employed. I am therefore grateful that he now gives the matter further publicity, and at the same time I regret the necessity for these observations,

the occasion for which would have been avoided had Dr. Mutch referred to my original paper and the discussion thereon as officially reported in the *Quarterly Journal of Pharmacy and Pharmacology*.—I am, etc.,

Runcorn, Oct. 19. NORMAN GLASS.

Spinal Anaesthesia

SIR,—I read with great interest Dr. H. K. Ashworth's excellent article on spinal anaesthesia (*Journal*, October 2, p. 671). May one venture to question the rationale of some of the generally accepted "essentials" of the technique, which are invariably recommended in any article on this subject?

It is a common experience that morphine and hyoscine alone are often not sufficient to steady the anxiety of the normal patient. My practice in premedication is to give morphine 1/8 to 1/4 grain, hyoscine 1/100 grain, atropine 1/100 grain (to counteract the respiratory-depressant action of morphine), together with a rectal injection of paraldehyde in 4 oz. of saline, the dose being 1 drachm per stone body weight, maximum 8 drachms. With this treatment patients sleep comfortably throughout the whole proceeding, and in four cases out of every five there resulted a total amnesia not only of the operation but also of the transport to and from the theatre and of the actual spinal injection. In a series of over fifty cases I have never had any anxiety caused by this admittedly heavy premedication.

Light percaine was used in doses varying from 14 c.cm. for females to 20 c.cm. for males. No ill effects were seen from this dosage, which is considerably higher than that advised by many authors. One recalls that 100 c.cm. of 1 in 1,000 percaine may safely be injected for local analgesia; the limiting factor in intrathecal injection is not the toxicity or the rate of absorption, but sheer volume.

I have found also that one may safely dispense with the Trendelenburg position, so often urged as essential in the use of light percaine. I have sometimes injected light percaine into a patient in the sitting posture. One would question the ability of a large bulk of anaesthetic solution to diffuse freely through the cobweb-like mesh of the subarachnoid space, seeing that the difference between the specific gravity of light percaine (1,004) and that of cerebrospinal fluid (1,006) is only two parts in 1,000. The upward spread of solution appears to be by bulk displacement at the time of injection rather than by subsequent diffusion with the aid of gravity. The upper level of anaesthesia is higher if the solution is injected rapidly.

On the other hand, with heavy percaine (specific gravity 1.026) gravity is of importance; there is a difference of specific gravity of twenty-two in 1,000, and only a small bulk of fluid to move.

For similar reasons I am sceptical of the value of the prone position assumed immediately after injection. For the acute abdominal case, and for the obese, this is impracticable, as it is for a heavily doped and helpless patient. The total volume of cerebrospinal fluid is 100 c.cm. or more, of which about 30 c.cm. lie in the vertebral canal. An injection of 16 to 20 c.cm. of anaesthetic solution will displace the whole of the natural fluid surrounding the lower half of the cord, and will in its course envelop both anterior and posterior nerve roots alike.

The practice of withdrawing prior to injection a volume of cerebrospinal fluid equal to that of the solution to be introduced is still often recommended, though less often than formerly. This habit is, I believe, responsible for some of the cases of intractable headache that have been associated with spinal anaesthesia. It is unfortunately necessary to drain away a certain volume of cerebrospinal fluid if a vein has been punctured, and it is these patients who suffer most from post-operative headache. The sudden release of pressure following the withdrawal of a considerable percentage of available fluid is to risk damage to the delicate tissues of the choroid plexus, which is responsible for the selective filtration of the cerebrospinal fluid from the blood serum. The headache which follows is due, I surmise, to increased intracranial pressure from defective filtration. I am without experimental confirmation of this theory, but clinically one notices that headaches are more frequent and more severe in proportion to the amount of cerebrospinal fluid lost or withdrawn.—I am, etc.,

D. STANLEY-JONES,
Hayle, Cornwall, Oct. 13. M.B., B.S., B.Sc., F.R.C.S.

Spinal Anaesthesia for Caesarean Section

SIR,—Dr. Herbert Spencer (*Journal*, October 9, p. 723) uttered a timely warning against the practice of using spinal anaesthesia for Caesarean sections, and I think the majority of British obstetricians are in agreement with him, though the authorities he quoted were Continental surgeons. While I have done several hundred general surgical operations under spinal anaesthesia without an anaesthetic death, I had, using the same technique, two deaths in a series of eighteen Caesarean sections. Both patients were in good condition before the anaesthesia, and both collapsed and died a few minutes after its introduction and before the operation was begun. In one case spinocain was used and in the other percaine. I have now abandoned the use of spinal anaesthesia for this operation.

Dr. Gordon Luker (October 16, p. 775) does not state how many cases he has done, but if his statement that he has "never yet found a fall in blood pressure" is literally correct, then either he has not taken the pressure during the operation or he has a truly remarkable and unique technique of which it would be interesting to have further details. While experienced obstetricians may have evolved a special technique, I think that surgeons who only perform this operation occasionally should bear in mind the fact that there is an increased risk in the use of spinal anaesthesia in advanced pregnancy.—I am, etc.,

Surrey County Hospital, Oct. 20. HENRY A. KIDD.

Ether Convulsions

SIR,—The following two cases of ether convulsions may be of interest:

The first patient was a boy, aged 19, with acute osteomyelitis of the frontal bone; his temperature was 102° F., his pulse rate 94. Induction was begun with nitrous oxide, oxygen, and ether, and a Magill's intratracheal tube was passed by the mouth; Boyle's apparatus was used. Anaesthesia was maintained by gas and oxygen passing over ether until the skin incision was completed and haemostasis secured, then by gas and oxygen only. Almost immediately after switching over to gas and oxygen facial twitching began, and was soon followed by general clonic convulsions, which rapidly became violent. The convulsions were synchronous with inspiration and less severe with expiration. The peripheral circulation failed, but the apex beat remained forcible. A few breaths of chloroform were given with oxygen, and 4 c.cm. of evipan was injected intravenously. This controlled the convulsions and the radial pulse returned. The operation was continued under gas and oxygen till the circulation began to fail once more, and the operation was then discontinued.

Coramine, 3.7 c.cm., was given intravenously, as was one pint of saline, which improved the patient's condition. He was taken back to bed with an intratracheal tube passing continuous oxygen, but, in spite of this and a blood transfusion, died seven hours later, his temperature having risen to 107° F. The blood pressure half an hour before death was 55/30 mm. Hg. A post-mortem examination showed osteomyelitis of the frontal bone, early meningitis, and multiple lung abscesses. There was no odour of ether detectable in the lungs.

The second case, occurring seven days later, was that of a man aged 58. His temperature was 98.4° F. and his pulse rate 80. He had a chronic suppurative otitis media, for which a radical mastoidectomy was being performed. The anaesthesia was induced and maintained as in the previous case, but more ether was used, as the operation took some time. Clonic spasms started at the end of the operation, when the skin incision was being sutured and ether was not being used. The convulsions were controlled with 4 c.cm. of evipan, and the patient sent back to bed, the head of the bed being raised and an intravenous saline given. The temperature rose to 103° F.; the blood pressure was 130/90 mm. Hg. This patient rapidly recovered, and next morning was remarkably well.

In both cases the ether in the bottle on the Boyle's machine was used for other patients with no ill effects, and the same machine had been used, and the details of the administration of the anaesthetic were the same, as in 257 other patients anaesthetized during the last two months.—I am, etc.,

Central London Throat, Nose and Ear Hospital, Oct. 12. H. G. EARNSHAW.

Pubertas Praecox

SIR,—Dr. Shapiro does not appear to have read my note on a case of pubertas praecox completely. I should like to draw his attention to this quotation from it: "The cervix uteri is well developed and the uterus on bimanual examination was found to be almost adult size. No enlargement of the uterine appendages could be detected." As one would not determine this by vaginal examination the only other way is per rectum. I should also refer him to a similar case under the care of Drs. Park and Novak at Johns Hopkins Hospital (1932). The child was operated on for a granulosa-cell carcinoma. A minute granulosa-cell adenoma was removed from one ovary at operation and confirmed on section. The child, however, continued to menstruate quite regularly after this. In a condition so little understood it would be wiser to adopt a less dogmatic opinion.—I am, etc.,

Southampton, Oct. 17. W. L. KERR, M.B., B.S.

"The Tonic Pupil"

SIR,—James Ware was the first English surgeon to describe hypermetropia. He did so in a famous paper, published in the *Philosophical Transactions of the Royal Society of London* in 1813, on "Observations relative to the Near and Distant Sight of Different Persons," in which the following passage occurs:

"It has also been commonly believed that the size of the pupil is influenced by the distance of the object to which the attention is directed, this aperture being enlarged when the object is far off, and becoming more and more contracted as it is brought near. But though the activity of the fibres of the iris is sometimes sufficient to be visibly influenced by this circumstance, yet in the greater number even of those cases where the dilatation and contraction of the pupil are powerfully influenced by a difference in the strength of the light the distance of the object considered alone produces so little effect upon it as to be scarcely perceived. That it has, however, in general, some degree of power on the pupil is highly probable; and an extraordinary instance of this kind exists, at the present time, in a lady between thirty and forty years of age, the pupil of whose right eye, when she is not engaged in reading, or in working with her needle, is always dilated very nearly to the rim of the cornea; but when she looks at a small object, nine inches from the eye, it contracts within less than a minute to a size as small as the head of a pin. Her left pupil is not affected like the right; but in every degree of light and distance it is contracted rather more than is usual in other persons. The vision is not precisely alike in the two eyes; the right being in a small degree near-sighted and receiving assistance from the first number of a concave glass, whereas the left eye derives no benefit from it. This remarkable dilatation of the pupil of the right eye was first noticed about twenty years ago, and a variety of remedies have been employed at different times with a view to correct it; but none of them have made any alteration. It should be mentioned that, in order to produce the contraction of the pupil, the object looked at must be placed exactly nine inches from the eye; and if it is brought nearer it has no more power to produce the contraction than if it were placed at a remoter distance. It should also be mentioned that the continuance of the contraction of the pupil depends, in some degree, on the state of the lady's health; since, though its contraction never remains long after the attention is withdrawn from a near object, yet whenever she is debilitated by a temporary ailment the contraction is of much shorter duration than when her health is entire."

It is possible that this nervous and anisometropic lady suffered from a tonic pupil in her left eye.—I am, etc.,

Glasgow, Oct. 23. W. J. B. RIDDELL.

Indications for Induction of Abortion

SIR,—Reduced to simple terms two things emerge from Dr. Percy Hardy's letter in the *Journal* of October 23 (p. 827). First, it is suggested that abortion should be legalized if three, or perhaps four, doctors, preferably general practitioners, with a wide knowledge "of the environment of women of the poorer classes who are ill," agree that pregnancy should be terminated. Secondly, these doctors, "not necessarily consultants"—this suggests that the medical problem is not the prime consideration—are to consider what the effects of pregnancy and childbirth would be on the patient in question. These are wide and vague terms of reference. The decision arrived at would constitute a fiat for an operation for abortion. The elastic terms of such a reference would make doctors a law unto themselves, and in fact would place them above the common law of England. What would the lawyers have to say about it?—I am, etc.,

London, S.W.1, Oct. 23. REDMOND ROCHE.

SIR,—I am in complete accord with the pleas put forward for the legal recognition of abortion in cases of genuine rape, but I wonder what your readers' opinions would be in relation to the following "eugenic" case.

A young lady was engaged to be married. On the eve of the wedding it was for the first time disclosed to her and her parents that her fiancé's father had committed suicide while of unsound mind. This naturally upset them very much, but the wedding was allowed to proceed on the understanding that there must be no children as the outcome. So far, so good—or bad. After a short time the husband himself became mentally affected, in what manner I do not know, but at any rate sufficiently to cause him to be admitted to an institution for several months. Shortly after his release, and in a spirit apparently of sheer irresponsibility and bravado, he threw precautions to the winds and impregnated his wife. This was the story of the girl and her mother when they presented themselves to me in the hope that "something could be done." They were both in a dreadful state of apprehension, and I think with reason. I am no mental expert, but I take it that the risk of the offspring (and the girl was undoubtedly pregnant) developing some psychosis

sooner or later was a very real one. I felt that there was every moral justification for the induction of abortion; but, at the same time, the girl being in perfect health (apart from her own mental state, which would also certainly react on her physically), the legal position was equivocal. I therefore referred her to an eminent gynaecologist, who saw her in consultation with an equally eminent alienist, and a third physician. This triumvirate, I am happy to say, decided in favour of induction. The pity of it was, to my mind, that the husband was not sterilised at the same time. It seems a lamentable thing, in a civilised and enlightened age, that persons of unsound mind, even if "cured," should be permitted any potentialities for parenthood.

They say that hard cases make bad law, but why need there be any hard cases in this connexion? Why cannot each case be decided on its merits—by a proper tribunal, of course. I am no advocate of any general relaxation of the law relating to abortion. I have no patience with healthy married couples who refuse to have children and who "go off the deep end" should pregnancy occur. I deplore the prospect of a falling birth rate, though I think (this by the way) that the very great difficulty of obtaining domestic help is the largest factor to-day in the decline of the middle-class family.

In the circumstances, I prefer to remain anonymous and sign myself—

Oct. 18. PRO PATRIA.

Prostigmine in Paralytic Ileus

SIR,—May I have a line or two in order to clarify the short report in the *Journal* of September 18 on the action of prostigmine in paralytic ileus? As it appears, the impression might be gained that the drug was used on the third day, whereas the remarkable point in the case was the effective emptying of the bowel on the eighth day, after all other measures—including in-lying gastric tube and continuous intravenous saline for the whole period—had failed, and a fatal ending seemed almost inevitable.—I am, etc.,

Johannesburg, Oct. 15. R. CAMPBELL BEGG.

Expulsion of Placenta Praevia in Advance of the Foetus

SIR,—This condition is certainly not as rare as it would seem from the note published by Mr. J. W. Nankivell (*Journal*, September 11, p. 527). In my practice I have had two cases of this type—one in 1925, of which I have no record, and another in 1930.

This second patient, a 10-para, was first seen by me on September 15, 1930, when she had a severe haemorrhage. On examination the os was one finger dilated, and there was an obvious placenta praevia. She was then six and a half months pregnant, and refused to have the pregnancy terminated. On September 30 she had another haemorrhage. I again suggested termination of the pregnancy, but the patient again refused. Four hours later three-quarters of the placenta had been expelled, and this was followed by the birth of the child. Then I suggested that the remains of the placenta should be removed manually, but the patient again refused interference, and the remaining portion of the placenta was expelled spontaneously after six hours. The patient made an uninterrupted recovery.

Though the bleeding on both occasions was fairly severe the patient was not collapsed, though very anaemic. On the second occasion I gave her an injection of pituitrin to encourage uterine contractions, but apart from this she had no other treatment at all.—I am, etc.,

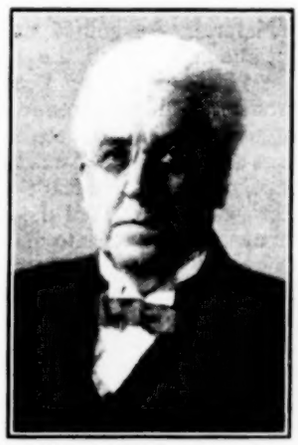
Mombasa, Kenya Colony, Oct. 11. S. D. KARVE.

Obituary

WILLIAM WRIGHT, M.B., D.Sc., F.R.C.S.

Professor of Anatomy and former Dean of the London Hospital Medical College

The death of William Wright on October 21 will be regretted not only by many generations of old London Hospital students, but also by a large number of friends outside the ranks of medicine. Wright was born in Wigan in 1874, the second son of Joseph Wright, an able and astute Scotsman. Despite the fact that he came of Scotch stock, and was brought up in a family where the Scottish accent was marked, his speech showed no trace of this origin; in fact, he acquired a slight Lancashire accent, which persisted to the end of his life.



Wright was educated at Wigan Grammar School and at Owen's College, Manchester, where he graduated in medicine. For a short time he was in general practice, but disliking this work and, perhaps, being temperamentally unfitted to it, he returned to Manchester, where he became demonstrator in anatomy. Thus began his life's work. From Manchester he moved to Birmingham as lecturer in anatomy in the University under the late Sir Bertram Windle. There he at once came to the fore by brilliant and elegant teaching of his subject. It was at Birmingham also that Wright began to develop those diverse interests which ever since have delighted and astonished his many friends. In music, in literature, both classical and modern, and in art he took a keen interest, and in thus interesting himself he was enabled to acquire that fastidious taste in these subjects which characterized his later years. It was in Birmingham, in fact, that the man grew to his proper intellectual stature, and to that city, and to his time there, he always looked back with affection.

Wright left Birmingham to become lecturer in anatomy at the Middlesex Hospital in 1905. During the years he was there he acted as subdean, and lived in the residents' college along with Lakin, Douty, and Gordon-Taylor. His anthropological interest had been aroused by his association with Windle at Birmingham, but it was at the Middlesex that he did his work on the prehistoric inhabitants of Britain that formed the subject-matter of his Hunterian Lectures before the Royal College of Surgeons in 1907, and his work on the morphology and variations of the human skull which culminated in his Hunterian Lectures of 1909. Later he made careful dissections of certain animals, and his Hunterian Lectures of 1913 were devoted to the comparative anatomy of the elephant. While at the Middlesex he continued his interest in classical literature and began the study of modern Italian. This was to bear fruit in later years in an intense interest in the historical aspects of anatomy. His two Arris and Gale Lectures in 1919 dealt with the anatomical work of Leonardo da Vinci, and it was for work in this field that he was made a Knight of the Order of St. Olaf. His two Vicary Lectures in 1925 and 1934 were devoted to the

"Mediaeval Conceptions of the Anatomy and Physiology of the Central Nervous System" and "Galen on the Eye" respectively. His last contribution, the Cavendish Lecture in 1936, was his demonstration, based on the relation between ossification and age, of the true identity of the bones of the Princes murdered in the Tower.*

In 1903 Arthur Keith was appointed Curator at the Royal College of Surgeons of England, and Leonard Hill, who was at that time teaching physiology at the London Hospital, asked Wright to come to the London to take Keith's place. Wright readily accepted this invitation, and generations of London Hospital students are, therefore, indebted to his teaching. Not only was he a brilliant lecturer with a ready command of the English language, but he could draw on the blackboard with consummate skill. Wright, indeed, could make the dry bones live!

Naturally he gained many academic distinctions. He became a D.Sc. of the University of Birmingham. He was Harveian Society Lecturer in 1933. In 1912 he was president of the Anatomical Section of the British Medical Association, having been secretary in 1904 and vice-president in 1910. Wright was the first treasurer, and then president, of the Anatomical Society, and was a member of the editorial committee of the *Journal of Anatomy*. He made many contributions to the society's meetings and to the Journal. Typical of these were his "Reports on Teratological Literature," prepared for many successive years for the Journal. Wright was joint author with Parsons of a handbook on practical anatomy designed especially for the primary fellowship examination: this book survives in a different form in the *Six Teachers' Anatomy* and the *Six Teachers' Anatomy for Dental Students*. In addition to examining for the London University and for the Royal College of Surgeons, he examined at different times for the Universities of Oxford, Glasgow, Liverpool, St. Andrews, Leeds, Bristol, and Aberdeen. He flew to India with Buckmaster in 1935 as a representative of the Royal College of Surgeons.

Soon after his appointment as lecturer in anatomy at the London Hospital, Munro Scott, late Warden of the Medical School, died, and Wright was appointed Dean of the Medical College in 1910, a position he was destined to hold for no less than twenty-seven years. Thus, for the first time, the affairs of the Medical School were directed not only by a member of the medical profession and a Fellow of the Royal College of Surgeons, but by a man whose administration and teaching were coloured by a background of culture and classical learning. It is, perhaps, difficult for the younger generations to realize how much the Medical School owes to Wright for his guidance in these early years. Knutsford and E. W. Morris were making the London Hospital: Wright took charge of the Medical School. Wright was largely responsible for the appointment of James Mackenzie to the staff of the hospital in 1911, and taking a great interest in the better education of dental students he was responsible for the foundation of the School of Dentistry at the London Hospital in October, 1911. Always conscious of the needs of the students, and realizing the particular difficulty confronting men working in the East End in those days, he was responsible for the opening of the old students' hostel in 1911. But this was merely a beginning, and in 1934 he had the satisfaction of seeing the opening of the present fine building by H.M. Queen Mary.

To all who knew him—and they were many—Wright was a great figure. To a wide circle of men he was a personal friend. Among his closer friends he reckoned Arthur Keith, William Bulloch, Leonard Hill, Gordon-Taylor, Marlborough Pryor, George Northcroft, and Buckmaster. Wright lived life to the full and enjoyed the society of men. He was a member of the Athenaeum, Burlington Fine Arts, and Savage Clubs, and a delightful companion at dinner. He was particularly fond of the Savage Club, where his long association resulted in his election as an honorary member. His spare time was devoted to books and pictures. Botany, geology, and gardening were among his hobbies. He was a life member of the Zoological Society and of the Zoological Club. His chief hobby was probably archaeology, and he was an active member of the Royal Archaeological Society. He spent his holidays visiting castles and churches, and happy were those who were privileged to accompany him on these expeditions. His house was made beautiful by a collection of lovely things, particularly paintings by the Japanese artist, Ishibashi, and among his most treasured possessions was the head of a Greek girl picked up on a rockery in the West of England, which had been sculptured during the best period of Athenian art.

Wright lived the greater part of his adult life with his close friend and companion, Gwynne-Jones, at Gerrards Cross. But Gwynne-Jones died in 1933. Only a few months ago, when he was already suffering from the long and ultimately fatal illness which he bore so patiently, he married Gwladys Gwynne-Jones, widow of his former friend. In 1912 he had caused the words "Amara-Lento-Tempera-Risu" from Horace to be inscribed over the entrance to the Medical College. This phrase Wright liked to translate: "Temper bitter things with a quiet smile." To this he remained faithful to the last.

[The photograph reproduced is by Elliott and Fry, Ltd.]

* *Archaeologia*, vol. lxxxiv.

T. A. GOODFELLOW, C.B.E., M.D.

Lecturer in Medical Ethics, Victoria University of Manchester

Dr. Thomas Ashton Goodfellow, one of the best-known general practitioners in Lancashire, died at his home on October 24, at the age of 72. Dr. Goodfellow was a student at Owen's College, Manchester, and qualified in 1888 with the M.R.C.S., L.R.C.P. In 1889 he took the M.B. of London, proceeding in 1891 to the M.D. His first period of hospital residence was as a house-physician at the Manchester Royal Infirmary. Later he acted as house-surgeon at the Salford Hospital, after which he was appointed resident medical officer at the Infirmary. It was after concluding this appointment that he went into general practice, and gradually built up a reputation as one of the most outstanding men in general practice in the North of England. He joined the British Medical Association in 1893, and always took the keenest interest in both local and national medical organizations. He was a member of the Manchester committee which had to administer the National Health Insurance Act when it came into force, and he later joined the Panel Committee, becoming in due course its chairman. He was also for many years associated with the small consultative committee of medical and allied services which was set up by the Ministry of Health to adjudicate and report on complaints of irregularity in carrying out the terms of service under the Act. During the war he acted as chairman of the Manchester Medical War Committee, which was entrusted with arranging for the supply of qualified men to the R.A.M.C. and looking after their practices during their absence on active service. He was also medical officer in charge of the auxiliary military hospital at Lawnhurst and Didsbury Lodge.

It was in 1919, as a representative of the general practitioners of the county of Lancashire, that he joined a medical consultative council set up by the Ministry of Health to consider the systematized provision of medical and kindred services for different areas throughout the country, the chairman of which council was the then Sir Bertrand Dawson. In 1920 Dr. Goodfellow was awarded the C.B.E. in recognition of his many public services. He was a member of Council of the British Medical Association for the three years 1914–16, and as recently as last year he was elected president of the Lancashire and Cheshire Branch. He was always an active member of both the medical and pathological societies of Manchester, and was at different times president of each body. It was his long experience and the reputation he had built up as a man of wide vision and unimpeachable integrity that led to his appointment in 1933 as a lecturer in the University of Manchester. He delivered then, and in subsequent years, a short course of lectures to final-year students on medical ethics and the conditions of medical practice, lectures which rapidly enhanced his already great popularity in Manchester. As to the man himself, a distinguished Manchester surgeon, who was his close friend for over forty years, writes:

The passing over of Tom Goodfellow, after a long and painful illness most patiently borne, will be deeply regretted by a wide circle of his colleagues, his patients, and his many other friends. Knowing of his brilliant early medical career, many of us were surprised that at the conclusion of his twelve months as resident medical officer to the Manchester Royal Infirmary he elected to enter general practice, as hitherto this office had always been regarded as a step towards becoming a consultant physician. He accepted a partnership with the late Dr. Massiah of Didsbury, and surely and steadily his professional skill, his old-world courtesy, his dignity alike of appearance, manner, and expression, his straightforwardness and intolerance of anything in the nature of shams, trickery, or injustice, his kindly generosity and lovable personality, his innate modesty and the entire absence of any self-seeking, his usually unruffled temper, and his large-heartedness, all combined towards our recognition of him as one of the leading and most respected of practitioners. Though intensely interested in the scientific aspects of disease, he never failed to visualize the human element behind it, and this humanity caused him to be consulted by his patients not only for their medical ailments but often for advice on their domestic and other troubles, since they ever found in him a most sympathetic friend and wise counsellor. His undoubted powers of organization led to his election to councils and committees of the Ministry of Health, the British Medical Association, and many local bodies. Only a few days before his death he received in his bedroom a deputation conveying a presentation from the Manchester Panel Committee for his services as chairman. Always a strong upholder of the ethics of his profession, he told me that of all the appointments he had ever held the one which pleased him most was that of lecturer in medical ethics at the University; he was the first to hold this office, and relinquished it only a few months ago on account of failing health. Although himself holding strong views on most matters of medical controversy, he was ever willing to give the fullest consideration to the other side of the question. His recreations included bridge, billiards, chess, and golf; in 1909 he was elected captain of the Didsbury golf club, and more recently its president. A lover of classical operatic music, he was for many years a regular attendant at the Hallé concerts, while he was himself a 'cellist and, in his younger days, a vocalist of no mean order. In every respect a model husband and father, it was a great relief to him that he was spared to see his three sons so well established in their careers, two of them in the medical profession, and his only daughter happily married to a medical officer in His Majesty's Navy.

F. W. BURTON-FANNING, M.D., F.R.C.P.

Consulting Physician, Norfolk and Norwich Hospital

Dr. Frederick William Burton-Fanning of Norwich died on October 23 after an illness of three months' duration. He was born in 1863, the son of the late E. F. Burton, at one time president of the Incorporated Law Society. He was educated at Winchester and at University College Hospital, becoming M.R.C.S., L.R.C.P. in 1885. He won the gold medal in medicine and became house-physician to Dr. Wilson-Fox at University College Hospital. After three years' residence as house-physician at Addenbrooke's hospital he became M.B., and later M.D., of Cambridge. In 1891 he was appointed physician to the Norfolk and Norwich Hospital, becoming consulting physician at the age of 65. In 1931 he was chairman of the board of management of the hospital. He was also consulting physician to several district and cottage hospitals in Norfolk.

A visit to a relative at Davos in the early nineties and the influence of the late Dr. Huggard aroused interest in consumption, and this disease continued to be the chief professional study of his life. Thus, in 1895 he began the "Open-air Treatment of Pulmonary Tuberculosis" at the Fletcher Convalescent Home at Cromer, and in 1899, with his cousin, the late Dr. W. J. Fanning, he started the sanatorium at Mundesley. In 1902 the generosity of some friends enabled the Kelling Sanatorium to be built for the treatment of patients of the poorer classes, and the medical direction was undertaken by Dr. Burton-Fanning and Dr. W. J. Fanning. Commencing with ten beds this sanatorium, of which Dr. Burton-Fanning has continued to act as consulting physician, now contains 150 beds. It was there that the "revolving shelter" was designed and introduced. In 1898 his first account of "open-air treatment" appeared in the *Lancet*, and in 1905 his book on *Open Air Treatment of Pulmonary Tuberculosis* was published by Cassells. He was elected a Fellow of the Royal College of Physicians of London in the following year.

Dr. Burton-Fanning had been a member of the British Medical Association for exactly half a century; he was honorary secretary of the Section of Medicine at the Ipswich meeting in 1900, and vice-president of the same Section at the Cambridge meeting twenty years later. In August, 1914, he was called up for service as major R.A.M.C.T. in the 1st Eastern General Hospital at Cambridge. Subsequently, when No. 55 General Hospital was organized at Cambridge he went out with it to France, to Ambleleuse, as officer in charge of the medical division, being promoted lieutenant-colonel. He leaves a widow and a son and daughter. His eldest daughter died in tragic circumstances as the result of burns while nursing as a V.A.D. at Cambridge during the war; and his eldest son was killed while serving with the Marine Division in France.

Mr. JOHN WILLIAM THOMSON, M.B., C.M., formerly senior surgeon to the Clayton Hospital, Wakefield, died at Sidmouth on October 8. A native of Scotland, Mr. Thomson studied at the University of Aberdeen, graduating in arts in 1891, and in medicine and surgery in 1895. After acting as house-surgeon at the Wakefield Hospital

he began practice in that city thirty years ago, and was appointed to the honorary surgical staff of the hospital. During the war he served in France with the temporary rank of major R.A.M.C., and after his return to Wakefield he published a number of papers on surgical subjects in the *Lancet* and the *British Journal of Surgery*. When ill-health led to his retirement from active work the governors of the Clayton Hospital elected him honorary consulting surgeon in recognition of the important part he took in the planning, building, and equipment of extensions, and of his services as chairman of the medical board. Mr. Thomson has also been for many years medical officer to the White Rose County Hospital in Park Lodge Lane. The Mayor of Wakefield attended the funeral on October 12, taking with him the silver casket and scroll, symbols of the City's Freedom, which Mr. Thomson was prevented by ill-health from receiving in person when it was conferred upon him some months ago.

We have to announce the death, at the age of 63, of Dr. ANNIE FLORENCE THEOBALDS, consulting physician to the Devonshire Royal Hospital, Buxton. She studied medicine at Edinburgh, graduating M.B., Ch.B. in 1905, and proceeded M.D. in 1911. Before going to Buxton she held successively two appointments in Yorkshire—pathologist and assistant medical officer to the West Riding Asylum, Wakefield, and resident assistant medical officer at the Halifax Poor Law Institution. She had also been clinical assistant at the Birmingham City Asylum. Dr. Florence Theobalds settled in practice in Buxton in 1909, and for many years was the only woman practitioner in the town. She was appointed to the staff of the Buxton District Hospital as honorary anaesthetist in 1912, and until the time of her death was closely associated with it and was a valued member of the executive and the house committee. In 1917 she was elected to the staff of the Devonshire Royal Hospital for Rheumatic Diseases, retiring recently under the age limit. She was intensely conscientious in the performance of her professional work, and will long be remembered by the patients who came under her care for her deep sympathy and kindliness. She was a member of the committee of the local district nursing association and for many years its chairman, and was also a member of the committee of the Cavendish High School for Girls. She was very reserved in disposition and shunned social life, while devoting herself to her patients and her public work without stint. Her sudden death will be deeply regretted by those who enjoyed the privilege of her friendship and the advantage of her professional skill. She had been a member of the Buxton Division of the British Medical Association since 1909.

The death of Dr. WALTER SANSOM has removed from Barrow one of its oldest and best-known practitioners, who was a native of the borough and spent almost the whole of his working life there. He was born on October 29, 1868, and studied medicine at the University of Edinburgh, graduating M.B., C.M. in 1890 and proceeding M.D. in 1898. After a short period of practice at Hadfield he returned to Barrow, and was honorary surgeon to the North Lonsdale Hospital from 1909 until his retirement in 1936, when he was appointed consulting surgeon. Dr. Sansom joined the British Medical Association in 1898, and was present at the first meeting in connexion with the formation of the Furness Division in 1903. He served on the executive committee in 1908–10, and was chairman of the Division in 1912. During the war he held a commission as captain in the R.A.M.C. "W. R. B." writes: Having been associated with the late Dr. Sansom as his partner in general practice for nearly a quarter of a century, I am glad to have the opportunity of adding a few remarks concerning my old friend. I have had an unbroken friendship with him all these years. He possessed a charming personality, an unfailing kindness of disposition, and he has given long and faithful service in the best interests of his profession. It can be truly said of him that those who knew him best loved him most, and he has left behind him in the hearts of most of us a very sweet memory of a true friend. He was laid to rest in Barrow recently, attended by a large number of those who had been associated with him during his professional life and who were anxious to pay their last tribute to one who was regarded with deep affection by all. My very deepest sympathy goes out to his son and his family in their sad bereavement.

By the death of Dr. DOUGLAS MCKISSOCK ROSS, aged 85 years, on October 9, Brighton has lost a veteran of the medical profession. He had been a member of the British Medical Association for fifty-six years, a period not equalled by any other member of the Brighton Division. Dr. Ross received his medical education at Edinburgh University and was dresser to Lord Lister, then professor of clinical surgery at the University. He took his M.D. at Edinburgh, and the diploma of M.R.C.S.Eng., and started practice in Brighton in 1874. He held the offices of police surgeon, physician to the Queen's Road Dispensary, and medical officer to the Poor Law institution. He was also visitor to the private licensed houses for lunatics in Brighton. His connexion with the latter lasted till his retirement from practice, when he was presented with many gifts from those associated with the institution, including a silver loving cup, a touching souvenir from the inmates, and an illuminated address from the guardians, expressing their appreciation of his long service—forty-two years in duration—and wishing him happiness in his retirement. Dr. Ross celebrated his golden wedding last year, when a group of Freemasons and doctors, some of whom had attended his wedding, waited on him to offer their congratulations to Mrs. Ross and the doctor. He was a Freemason of many years' standing, and was Master of the Royal Clarence Lodge. Six years ago he was presented with a silver salver to commemorate his fifty years of membership. Dr. Ross lost two sons in the war. He was a man of quiet and unassuming personality, loved and respected by all those with whom he came in contact. His funeral took place on October 12 at Christ Church, Brighton, followed by his burial in Hove Cemetery. It was attended by many of his friends and fellow practitioners, who wished to pay a tribute to a loyal and faithful colleague who had dwelt among them for over fifty years in friendship and agreement.

We regret to announce the sudden death on October 11 at Blairgowrie of Dr. WILLIAM HUNTER HOWAT, who formerly practised at Dalmellington, Ayr. He studied medicine at the Universities of Glasgow and Edinburgh, and graduated M.B., Ch.B. of the former in 1915. During the war he served with a temporary commission as Captain R.A.M.C., and he was for some time physician superintendent of the Lightburn Fever Hospital, Lanark. Dr. Howat joined the British Medical Association immediately after graduation, and acted as representative at the Annual Meetings of 1925 and 1935, and was chairman of the Ayrshire Division in 1935–6.

A familiar figure in the Crumpsall district of Manchester has passed away in the person of Dr. THOMAS HENRY WIGNALL. Having graduated at Manchester in 1898, he secured an apprenticeship in general practice as an assistant, and then settled in the Blackley-Crumpsall district, where he pursued his life-work. He carried out in a characteristically thoughtful way the rigorous duties of his profession. For some years he acted as radiologist to the Crumpsall and Booth Hall Infirmaries, gaining in this capacity a profound knowledge of the local population; and when, in 1918, he took up industrial work, he brought to it a wealth of experience of the conditions of life among the workers. Later in the same year he joined the medical service of the British Dyestuffs Corporation Ltd., and remained there until his death. As the

years passed he devoted more and more time to the manifold problems involved in the hazards of chemical industry, until in recent years he had practically abandoned private practice. In days when the study of industrial disease was still in its infancy he investigated many of the conditions which result from exposure to toxic substances, and was instrumental in bringing about the establishment of improvements in plant and the introduction of measures which rendered the working conditions of men in the chemical industry much safer. His endearing personality made him a *persona grata* among workers at a time when they regarded medical service in industry as a matter for suspicion, and his passing will be almost as keenly felt by them as by his more intimate associates. As a member of the later-established I.C.I. Medical Service he endeared himself to his colleagues, and his wealth of experience and knowledge of works organization and of men was of a sort not easily to be replaced.

Dr. Harry Swift, well known as a physician in South Australia, died on September 30 at North Adelaide at the age of 79. He was a son of John Swift of Woodhouse, Ely, Cambridgeshire, and his elder brother, Dr. W. J. C. Swift, practised for many years in Gordon Square, Bloomsbury, and was medical officer to the Foundling Hospital. Harry Swift studied medicine at the University of Cambridge and St. George's Hospital, qualifying as M.R.C.S. in 1882 and taking his M.B. in the following year ; he proceeded M.D. in 1887. In Adelaide he was for many years physician to the Children's Hospital and dean of the faculty of medicine in the University. He joined the British Medical Association in 1888 and served as Representative of South Australia at the Annual Meeting at Exeter in 1907 and at Aberdeen in 1914. It was in the latter year that his name came before the profession generally through his report on cases of "pink disease," which he described under the name of erythroedema.

Dr. Thomas Arthur Frank Hood of Blairgowrie, Perthshire, who died on September 20 at his residence at Rattray, had been a member of the British Medical Association since 1895. Having received his medical education at Edinburgh, he graduated M.B., C.M. in 1884, and for fifty years had energetically conducted a large practice in East Perthshire. Dr. Hood was one of the earliest practitioners in the midlands of Scotland to take to motoring, his first car having been obtained in 1901. He was for many years parochial medical officer of Rattray, and joint medical superintendent of the Strathmore Infectious Diseases Hospital. During the war he was joint medical officer of the V.A.D. Hospital in Rattray, and in medical charge of the troops stationed at Blairgowrie. He was always a strong supporter of local philanthropic work, took an active part in the management of the cottage hospital, the Blairgowrie and Rattray Nursing Association, and the Strathardle and Glenshee Nursing Association. For a quarter of a century he was medical adviser to the Blairgowrie Lodge of Ancient Shepherds, this appointment terminating only with the introduction of the National Health Insurance Act. Dr. Hood is survived by his widow, his only son having died from wounds in France in 1916.

We much regret to announce the death of Dr. J. S. Manson of Warrington, who was for many years an indefatigable worker for the British Medical Association, both in his own Division and at headquarters. We hope to publish an account of his career next week.

In the obituary notice of Sir John William Moore published last week it should have been mentioned that he was a member of the Council of the British Medical Association on two occasions—1899–1900, and again in 1902–3.

Universities and Colleges

UNIVERSITY OF OXFORD

Dr. E. Mallam has been appointed Litchfield Lecturer in Medicine and Mr. R. H. Rose-Innes Litchfield Lecturer in Surgery.

In Convocation on October 19 the University decreed that there shall be established, until October 1, 1941, a second May Fellowship in Medicine tenable under the same conditions as the May Fellowship and Readership in Medicine established by Decree (1) of April 8, 1933, with the following exceptions: (1) The holder of the Fellowship shall be styled the Second May Reader in Medicine and shall not hold office later than October 1, 1941. (2) The stipend attached to the Fellowship shall be £300 a year.

The Curators of the University Chest were authorized to receive from the Rockefeller Foundation in the year beginning October 1, 1937, a sum not exceeding 3,000 dollars as a contribution towards scientific apparatus, laboratory material, and special cages for primates required for research in the Department of Human Anatomy.

Professor J. Boeke of Utrecht will deliver a lecture on "The Innervation of the Skin, Spinal and Sympathetic, in Degeneration and Regeneration" in the lecture theatre of the Physiology Department on Friday, November 5, at 12 noon.

UNIVERSITY OF LONDON

Dr. C. M. Wilson has been appointed as a representative of the general medical schools on the Senate for the remainder of the period 1936–40 in place of Professor T. B. Johnstone, resigned.

A. R. Todd, D.Sc., D.Phil., has been appointed from October 1 to the University Readership in Biochemistry tenable at the Lister Institute of Preventive Medicine.

At a meeting of the Senate held on October 20, with the Vice-Chancellor in the chair, Dr. T. C. Stamp was appointed to the University Readership in Bacteriology tenable at the British Postgraduate Medical School.

An offer by Mr. A. Chester Beatty to provide a Scholarship in Radiology of £400 a year for two years was accepted with the cordial thanks of the University. This scholarship will enable a student of radiology, after obtaining the Academic Diploma in Medical Radiology, to spend a year in one of the great radiological clinics of the United States.

UNIVERSITY OF LIVERPOOL

The following candidates have been approved at the examination indicated:

Diploma in Public Health.—J. A. Bentham, G. R. Griffith, S. M. Laird.

UNIVERSITY OF MANCHESTER

Dr. H. W. Dalton has been appointed Demonstrator in Pathology.

The resignation of Mr. H. B. May of the post of Assistant Lecturer in Bacteriology as from December 25 has been accepted.

UNIVERSITY OF WALES

The following candidates have satisfied the examiners in the examination indicated:

Diploma in Public Health.—*Part II:* W. J. M. Evans, G. E. Phillips, D. T. Richards, B. A. Thomas, D. A. O. Wilson.

Welsh National School of Medicine

The following candidates for the degrees of M.B., B.Ch. have satisfied the examiners in the subject indicated:

Hygiene.—D. W. Absé, O. D. Beresford, S. W. Beswick, R. T. Bevan, *D. C. Brown, Alice Davies, Miriam E. Davies, D. G. Evans, M. Lewis, W. G. Miles, A. H. Millard, Mary D. Owen, *Enid M. Powell, W. L. Ll. Rees, R. Tipple, *Emily K. Williams, H. O. C. Williams, Mary Williams.

* With distinction.

UNIVERSITY OF DUBLIN

School of Physic, Trinity College

The following candidates have been approved at the examinations indicated:

Final Medical Examination.—*Part I, Materia Medica and Therapeutics, Pathology and Bacteriology:* *P. M. Goedvolk, *H. H. Balch, *G. O. Atkinson, †D. W. M'Carthy, †P. H. Rubenstein, †S. Tennenbaum, †G. F. N. Anderson, W. E. Bamford, J. P. Condon, E. N. O. Sodeinde, R. F. G. Lyons, M. Shreider,

D. St. B. F. Nunan, J. H. Tyrrell, Moira M. Mallagh, E. R. Coetzee, H. J. F. Draffin, E. F. Keating, G. S. Sheill, T. N. Arthur, J. R. A. Martin, Miriam A. Bagget, Annie Dowds, S. F. H. Haughton.

DIPLOMA IN GYNAECOLOGY AND OBSTETRICS.—J. N. Sengupta, S. Bandyopadhyay.

* First-class honours. † Second-class honours.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH

At a meeting of the Royal College of Surgeons of Edinburgh held on October 19, with Mr. Henry Wade, President, in the chair, the following successful candidates were admitted Fellows: P. C. Barkla, J. Benson, B. D. Best, M. D. Black, W. A. Browne, S. R. Chandra, P. N. Chaudhuri, J. V. Clark, A. Conway, W. C. J. Cooper, D. H. Craig, Lydia M. Duff, I. M. D. N. Farquharson, G. N. Findlay, B. P. Funder, H. W. Gordon, H. M. Grant, H. J. Green, P. W. Ingram, E. S. Lawrie, H. Macmillan, I. P. J. MacNaughton, H. C. Maling, H. V. Morgan, S. K. Sen, C. L. E. L. Sheppard, E. W. Thomas, N. J. Townsley, R. Walkingshaw, E. W. Watts, A. J. Webster, R. Whittaker, T. I. Wilson, J. G. Youngman.

At the annual meeting of the Royal College of Surgeons of Edinburgh, held on October 20, the following officers were elected for the ensuing year: *President*, Mr. W. J. Stuart. *Vice-president*, Mr. Henry Wade. *Secretary and Treasurer*, Mr. J. W. Struthers. *Representative on the General Medical Council*, Mr. Alex. Miles. *Convener of Museum Committee*, Mr. A. Logan Turner. *Librarian*, Mr. H. M. Traquair. *Conservator of Museum*, Mr. C. F. W. Illingworth.

ROYAL COLLEGE OF PHYSICIANS OF LONDON

The Bradshaw Lecture on "The Genetics of Transposition of the Viscera" will be delivered by Dr. E. A. Cockayne at the College, Pall Mall East, S.W., on Thursday, November 4, at 5 p.m., and the Fitzpatrick Lectures on "Conquest of Disease in the Tropics" by Dr. Harold Scott on Tuesday and Thursday, November 9 and 11, at 5 p.m.

Medical Notes in Parliament

The second session of the present Parliament was prorogued on October 22 after the Lord Chancellor had read a King's Speech which reviewed the work done. The Speech hoped that the fullest possible use would be made of the Physical Training and Recreation Act. It went on: "The national health services have been further developed and improved. The rate of progress in the clearance and replacement of slums has been satisfactorily maintained, the abatement of overcrowding is proceeding, and house building has continued at a high rate." The Speech also referred to the Factories Act, whereby greatly improved provision had been made for securing the safety and health of factory workers and to the measure for the development and improvement of maternity services in Scotland.

The King opened the new session in the House of Lords on October 26. In the course of the King's Speech it was stated:

"My Ministers are anxious that energetic steps shall be taken to complete the measures for the protection of the civilian population against air raids. A Bill to put the necessary arrangements on a statutory basis will be brought forward for your consideration.

"My Government have announced their intention to assist the production and to increase the consumption of milk, and to facilitate the improvement of milk distribution. A Bill to this end and further proposals for the welfare of agriculture will be submitted to you.

"A comprehensive publicity campaign is being undertaken to ensure the fullest use of the public health services and to encourage their expansion. The policy of improving housing conditions will be energetically pursued.

"My Government will further develop their social policy by introducing legislation to enable meals to be supplied to boys and girls attending junior instruction centres; to provide medical care for young persons who have left school and entered employment; to reduce the age limit for the award of pensions to blind persons; to enable further information to be obtained for the study of the population problem; to amend the financial provision for slum clearance and the abatement of overcrowding; and to make further provision for the improvement of agricultural housing.

"A measure will be laid before you to amend the penal law and to enable improved arrangements to be made for dealing with offenders, including juveniles and those who commit repeated offences.

"Legislation on the subject of rural housing in Scotland and on other matters of Scottish interest will be submitted to you."

During the subsequent debate on the same day in the House of Commons Sir John Simon said that legislation would be introduced in due course for the assistance and development of the milk industry. The guiding principle would be that an increase in the consumption of liquid milk would result in advantage both to the national health and to the producers. This could best be secured by creating greater confidence in the safety and cleanliness of the milk supply. Measures designed to raise the standard of our dairy herds were also proposed.

League of Nations Nutrition Report

Asked by Mr. Keeling, on October 21, what action he proposed to give effect to the recommendation of the League of Nations Mixed Committee on Nutrition that every Government should conduct a vigorous policy of education on nutrition for the instruction of the general public, Sir KINGSLEY WOOD said Earl Stanhope and he recognized the importance of education on this subject. This would be dealt with in the course of the national health campaign now in progress.

Investigation into Incapacitating Sickness

Sir Kingsley Wood is considering the general question of a comprehensive investigation into the extent and incidence of various forms of incapacitating sickness among insured persons, but is not yet in a position to say in what form the results of any such investigation would be made generally available.

Vaccination Deaths.—Mr. T. GROVES asked, on October 21, whether, taking the averages for the last thirty years, although less than half the babies born in this country were vaccinated, the deaths caused by vaccination to children under 5 were more than twice as many as those caused by small-pox. Sir KINGSLEY WOOD, in reply, said Mr. Groves's conclusions seemed to have been arrived at by including among the deaths caused by vaccination all cases in which vaccination was mentioned on the death certificate, although in many of these the death was assigned by the Registrar-General to some other cause. Sir Kingsley further told Mr. Groves that he did not propose to take steps for the discontinuance of vaccination.

Inoculation against Influenza in the Army.—Mr. GROVES asked, on October 21, whether the arrangements made in December, 1936, to inoculate against influenza 500 men from five corps were carried out; if so, whether any of them, and how many, subsequently developed influenza; and what was the interval in each case between the inoculation and development of influenza? Mr. HORE-BELISHA replied that 678 men who volunteered were inoculated against influenza; of these eighteen developed illnesses diagnosed as "influenza," ten during the first, two during the second, and six more than two weeks after inoculation. The inoculations were carried out at the time when the influenza epidemic was at its height. Before any beneficial effects of inoculation could have had

time to operate the general influenza incidence had become so low that no conclusions as to the efficacy of the inoculations can be drawn.

Surgical Catgut.—Mr. Rhys Davies asked, on October 22, whether the Minister of Health was aware that at a recent inquest it was disclosed that the patient, operated upon in hospital, had died from tetanus brought about through the use of diseased gut, and he asked the Minister to take steps to ensure that in future all gut used in this way should be free from dangerous bacilli. Sir Kingsley Wood replied that he did not know of the inquest to which Mr. Davies referred. Regulations had recently been issued with the object of securing the sterilization of surgical catgut.

The Services

HONORARY SURGEON TO THE VICEROY

Lieut.-Colonel J. A. S. Phillips, C.I.E., I.M.S., has been appointed Honorary Surgeon to the Viceroy and Governor-General of India.

DEATHS IN THE SERVICES

Lieut.-Colonel Eric Edward Doyle, C.I.E., D.S.O., Indian Medical Service, died at Torquay on September 29, aged 51. He was born on September 18, 1886, was educated in the Bombay Medical College, and joined the I.M.D. as an assistant surgeon on October 1, 1906. He resigned that service on November 10, 1909, and going to Europe took the triple qualification at Edinburgh in 1911, and entered the I.M.S. as lieutenant on July 29, 1911. He got a brevet majority for war services on June 3, 1919, became major on January 29, 1923, and lieutenant-colonel on January 29, 1931. He served in the war of 1914-18 and in Afghanistan in 1920, when he was mentioned in dispatches in the *London Gazette* of August 3, 1920, and received the D.S.O. on January 1, 1920. He also received the C.I.E. on January 1, 1931. His appointment in India was that of Inspector-General of Prisons in the Bombay Presidency.

Medical News

Sir Arthur MacNalty, K.C.B., Chief Medical Officer of the Ministry of Health and the Board of Education, opened on October 18 the Hammersmith Health Week and Exhibition. In the course of his address Sir Arthur referred to the work of the local authorities in producing a healthy environment and in providing facilities to secure so far as possible that the future citizen shall be a healthy individual. But progress in national health could not be made without public support, and without the co-operation of the medical practitioner, who should be in close touch with the medical officer of health and kept fully informed of the health services in his area.

Dr. W. A. Lethem will deliver the Benjamin Ward Richardson Lecture at the Royal Sanitary Institute, 90, Buckingham Palace Road, S.W., on Tuesday, November 9, at 5.30 p.m. His subject is "Slaughterhouse Practice at Home and Abroad." A sessional meeting of the Institute will be held at Grimsby Town Hall on Friday, November 12, at 5 p.m., when papers will be read by Mr. W. R. Barnaby on "Artesian Wells in North-East Lincolnshire" and by Mr. H. Parkinson on "Youth and Public Health: Career or Vocation?"

The next course of lectures on tropical hygiene for men and women outside the medical profession proceeding to the Tropics will be given by Dr. H. B. Newham, Professor R. T. Leiper, F.R.S., and Mr. H. H. Clay at the London School of Hygiene and Tropical Medicine, Keppel Street, Gower Street, W.C., from Monday, November 29, to Friday, December 10 (Saturday and Sunday excepted), from 4 to 5 p.m. Applications for admission to the course, the fee for which is £1 1s., should be made to the secretary of the London School of Hygiene and Tropical Medicine.

An Argentine Congress of School Hygiene will be held on November 19 and 20 at La Plata, under the presidency of Dr. Carlos S. Concetto, when the following subjects will be discussed: the campaign against tuberculosis in schools, defective nourishment in school children, holiday colonies, instruction of abnormal children during the school age, compulsory medical examination of teachers, and the means of securing medical and dental attention for school children in the country.

A meeting of the Hunterian Society will be held at Apothecaries' Hall, Water Lane, E.C., on Monday, November 1, at 9 p.m., when a discussion will take place on "That the General Practitioner should not be Excluded from the Practice of Midwifery," to be opened by Dame Louise McIlroy, Dr. W. H. F. Oxley, and Professor J. M. Munro Kerr.

The annual dinner of the Harrogate Medical Society on October 23 was attended by a large and representative gathering, with the president, Dr. Sinclair Miller, in the chair. The chief guest of the evening was Dr. Donald Hunter of the London Hospital, who earlier on had delivered the annual oration of the society, choosing as his subject diagnosis. Dr. W. Yeoman proposed the toast of the Mayor and Corporation of Harrogate. He reviewed the progress of the town and paid tribute to the wisdom of the corporation in embarking on the erection of the New Royal Baths. Dr. Curtis Bain proposed the health of the guests, and the coroner, Colonel Innes Ware, the Harrogate Medical Society.

The annual dinner of the Society of Medical Officers of Health will be held at the Piccadilly Hotel on Friday, November 19, at 7.15 for 7.30 p.m.

Lieut.-General Sir Harold Fawcus, Director-General of the British Red Cross Society, left London on October 17 for Geneva to join the commission of experts, convened by the International Red Cross Committee, meeting there this week. The revision and extension of the Geneva Convention of 1929, made necessary by the increasing problems of aerial warfare, is the most important item on the agenda, which may also include discussion on Red Cross activities in China and Spain.

The bequests to medical institutions by the late Sir Frederick Gardiner, some of which are payable on the death of his wife and include an obligation to the University of Glasgow, are: £5,000 towards the building of the Gardiner Medical Institute, Glasgow University, and £2,000 towards the equipment of the institute, £3,000 to the Glasgow Cancer Hospital, for purposes of research, and £1,500 to the Western Infirmary.

Dr. Arthur Holdsworth Davis of Bournemouth, who died on July 28 leaving estate of the gross value of £27,485, bequeathed £1,000 to St. Bartholomew's Hospital to endow a bed in memory of his wife; £1,000 to St. Bartholomew's Hospital Medical College in memory of his wife; his residence and effects to the Royal Medical Benevolent Fund, and smaller legacies to other charitable institutions; and the residue of his property to the Royal Medical Benevolent Fund.

At its meeting in Paris last July the International Hospital Association decided to hold its 1939 congress at Toronto, the time and place to be decided later.

Professor P. Mühlens has been elected president, and Geheimrat Professor Nocht president of honour, of the German Society of Tropical Medicine.

Professor Charles Du Bois, director of the Dermatological Clinic at Geneva, has been elected president and Dr. E. H. Hermans of Rotterdam vice-president of the International Union against the Venereal Peril.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.

ORIGINAL ARTICLES and LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone, unless the contrary be stated. Correspondents who wish notice to be taken of their communications should authenticate them with their names, not necessarily for publication.

Authors desiring REPRINTS of their articles published in the *British Medical Journal* must communicate with the Secretary, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. Authors over-seas should indicate on MSS. if reprints are required, as proofs are not sent abroad.

All communications with reference to ADVERTISEMENTS should be addressed to the Advertisement Manager. Orders for copies of the *Journal* and communications with reference to subscriptions should be addressed to the Secretary, B.M.A. House, Tavistock Square, W.C.1.

The TELEPHONE NUMBER of the British Medical Association and the *British Medical Journal* is EUSTON 2111.

The TELEGRAPHIC ADDRESSES are
EDITOR OF THE *BRITISH MEDICAL JOURNAL*, *Aitiology Westcent, London.*
SECRETARY, *Medisecra Westcent, London.*

The address of the B.M.A. Scottish Office is 7, Drumsheugh Gardens, Edinburgh (telegrams: *Associate, Edinburgh;* telephone: 24361 Edinburgh), and of the Office of the Irish Free State Medical Union (I.M.A. and B.M.A.), 18, Kildare Street, Dublin (telegrams: *Bacillus, Dublin;* telephone 62550 Dublin).

QUERIES AND ANSWERS

Treatment of B. Coli Pyelitis

"ABU" writes: Could any colleague suggest a line of treatment for the following case? A girl, aged 6, suffers periodically from attacks of abdominal pain and vomiting, followed by haematuria and albuminuria. The last attack, six months ago, responded rapidly to the usual urinary sedatives and antiseptics. The present attack is not responding to treatment, and the urine now contains not only blood and albumin, but also *B. coli*. I take it the condition is one of *B. coli* pyelitis.

Nocturnal Twitching of Lower Limbs

"WILTS" has a patient, aged 39, who is much troubled with spasmodic movements and twitchings of the lower limbs in the late evening, particularly in bed. She describes the condition as the "fidgets." Physical examination is entirely negative, and, apart from this distressing condition, the patient is perfectly well. Suggestions as to aetiology and treatment would be appreciated.

Income Tax

Change in Partnership

Y. explains that X. and Y. were in partnership on a half-share basis up to March 31, 1937, when Z. took over X.'s share. The assessment for 1936–7 was based on the earnings of the practice for 1935, and tax thereon was paid in January and July, 1937. What is the position of X. and Z. with regard to the July instalment?

*** The tax is in respect of the income of the practice for the year ended April 5, 1937, and—ignoring the five days March 31 to April 5—Z. has no share in the income of that year, and is not concerned in the July instalment in any way. That payment should be shared between X. and Y., as if the change in partnership had not taken place.

Proportion of Rent, etc., as Expense

"G.P." lives in a neighbourhood which has greatly deteriorated residentially. The whole of the ground floor is used for purposes of the practice, but the local inspector of taxes will allow only two-fifths of the rent, etc., as against one-half, which "G.P." claims. Should he appeal against that decision?

*** "G.P." would be well advised to write to the inspector—or call and see him—and say that unless he can reconsider his decision a formal appeal will be made. Notice should be given when the formal notice of assessment is received. "G.P." can appeal either to the "Special Commissioners," in which case the hearing will be in London, or to the General Commissioners, in which case the hearing would be somewhere in the neighbourhood. In either case the proceedings are entirely confidential; "G.P." would be asked to explain why he claims one-half instead of two-fifths of the rent, etc., and the Commissioners would give their decision immediately.

LETTERS, NOTES, ETC.

Cysts in Upper Incisor Region

Mr. H. T. ROPER-HALL, M.B., B.D.S. (43A, Calthorpe Road, Five Ways, Birmingham, 15) writes: In connexion with a paper which I am preparing upon the cysts which occur in the upper incisor region, I shall be grateful if readers will be kind enough to let me have details of any of their cases, preferably of non-dental origin, such as those of the incisive canal, etc. Radiographs and models or diagrams of this area will be very welcome.

An American Medical Publisher

Dr. WALTER R. BETT sends from New York the following appreciation of Paul B. Hoeber, who died on August 20: One of the best-known medical publishers in the English-speaking world, Hoeber was a puzzling blend of sophistication and simplicity, of aggressiveness and generosity, of cynicism and ideals. Though he lacked the accepted attributes of the successful business man, he possessed a shrewd insight into human character and excelled in diplomacy when occasion demanded. Small, alert, impatient, excitable, enlivening his conversation with telling bits of German slang and jumping from one topic to another, the invariable cigar between his lips, even when telephoning—so he impressed himself upon the casual visitor. Those who knew him more intimately penetrated below his impulsive and fidgety make-up and learnt to respect his sympathy, disinterestedness, and courage. At the age of 18 Hoeber started a medical bookstore on East 59th Street, New York City, throwing himself wholeheartedly into this venture. Not content with supplying the books which were asked for, he made a point of knowing the subjects in which his customers were interested, so that he could show them any new publication in their line of work. As business flourished he moved to Fifth Avenue in 1926. Meanwhile he had begun to publish books under the name of his firm, Paul B. Hoeber, Inc. Among the journals which he issued the *Annals of Medical History* deserves to be singled out for special mention. While admittedly filling an intellectual need, commercially this was a risky undertaking at any time, especially in the days of the war. Hoeber not only launched this magazine, but for twenty years took a legitimate pride in its reputation as the "aristocrat of medical journals," sparing no expense in the service of its type and illustrations. Until quite recently advertisements had been rigidly excluded from its numbers. Himself keenly interested in medical history, he published many valuable monographs in that field, such as the *Clio Medica* series. The walls of his Fifth Avenue office were covered with signed photographs of medical historians throughout the world—a remarkable and fascinating collection. But he had set himself too high a standard in excellence, not caring sufficiently whether he made any material profit if only his intellectual children were proudly attired. To escape inevitable results, in 1935 he wisely decided to join forces with Harper and Brothers of New York. His publications continued to retain the name of his firm: "Paul B. Hoeber, Inc., Medical Book Department of Harper and Brothers"—a concession which gave him great pleasure.

Rural Hygiene in the Far East

In our notice of the report of the Inter-governmental Conference of Far-Eastern Countries on Rural Hygiene published on October 23 at page 815, the name of the publishers of the report (Messrs. George Allen and Unwin Ltd., 40, Museum Street, W.C.1) and the price (2s. 6d.) were omitted.

Medical Golf

A meeting of the London Irish Medical Golfing Society was held at Princes, Sandwich, on October 16 and 17, with the following results. O'Malley Cup: J. Ambrose, 2 up. Lett Cup: P. A. Smyth, E. Goggin. Canny Ryall Cup: P. Nyhan (18) 66, E. Goggin (11) 68; B. Doyle (14) 70. President's Prize (scratch): R. H. Jones (4) 155. Captain's Prize: R. H. Jones (4) 5 up. Cahill Trophy: R. H. Jones (4) 146 Mannix Cup: J. Herbert, 314; M. J. Smyth, 315. Junior Prize: F. L. M'Laughlin. Veteran's Prize: J. Grace. Best scratch score on October 17: J. A. Flaherty, 71 + 1 = 72.